

Only 85p

# Commodore

October 1984

## HORIZONS

**Solor Software  
presents  
BMX Racer**

**Chip Shop  
on the air**

**Protect your  
software**



**WIN  
£150 of  
Gremlin s/w**

**DISK DRIVE  
SPECIAL**

# BEYOND

CHALLENGING SOFTWARE

## ANKH

*will take your mind...*

What the team of SUTS OF ANKH PORTALS  
THROUGH THE CORRIDORS OF SHADOW-PROCESSES  
TO THE DEPTHS OF DREAMS AND THE PEAKS OF ACHIEVEMENT  
LAUNCH YOUR WINDPICOSE INTO ITS REMARKABLE ROOMS  
AND UNRAVEL THE MYSTERY WHICH IT HAS EVER OPENED  
YOUR CLOSER TO UNCOVERING THE  
RULES BY WHICH THE METAPHYSICAL WORLD  
OF ANKH IS GOVERNED: THE RULES  
TODOLAND TORTURE AROUND WITHIN

**The ONLY 3D Chess Game!**

MyChess is the only chess game available for the Commodore 64. Our state-of-the-art graphics give you two 3D views, turn 360-degree pan and tilt with joystick or using a mouse, move on the screen with real-time scrolling and move it fast enough to make you go nuts! It gives you a complete chess set, MyChess 8 levels of difficulty, 64 pieces, all performance. And the best of all, it's as easy as 1-2-3. ☐ mouse play ☐ joystick ☐ keyboard ☐ touch screen

**mychess**

If you'd like to buy our chess program, make a **MYCHESS 81**

FLUKE 8000 ME

ANKH 10.95 (quantity 1) 11.95 (2x)      Commodore 64

MYCHESS 81 10.95 (quantity 1) 11.95 (2x)      "

ASTEC 10.95 (quantity 1) 11.95 (2x)      "

Mr. Robot 10.95 (quantity 1) 11.95 (2x)      "

CITY      10.95

Address: 8000 ME

Beyond order line 0800 24067

Please add some details of the "Beyond" club

Send back a Postal Order/Check

to Beyond, or change my Credit

Card

CARD NO.

CARD EXPIRATION DATE

NAME

ADDRESS

Post Code

Signature

BEYOND, Competition House, Parkside, Market Harborough, Leicestershire LE16 9PL





# Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain busily ticks over.

To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

And for those you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory.

Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.



COMMODORE 8000 ☐  
Dot matrix printer (200/300)  
Printer/plotter (Print speed)  
20 characters per second



COMMODORE 8000 ☐  
Dot matrix printer (200/300)  
Printer/plotter for standard  
paper (Print speed)  
20 characters per second



COMMODORE 8000 ☐  
Dot matrix color printer  
(200/300, 7 colors including  
black) (Print speed)  
20 characters per second



COMMODORE 8000 ☐  
Color dot matrix printer (200/300)  
After quality print on  
standard paper (Print speed)  
10 characters per second



COMMODORE 8000 ☐  
Printer/plotter (200/300) for  
standard paper (Print speed)  
10 characters per second



COMMODORE 8000 ☐  
Data bus (200/300)  
1000 baud rate (200/300)



COMMODORE 8000 ☐  
Cassette unit, for Commodore  
80 and Commodore plus 1  
COMMODORE 8000 ☐  
for Commodore 80  
100/300 baud

COMMODORE 8000 ☐  
Color monitor (200/300)

COMMODORE 8000 ☐  
Printer/plotter (200/300)

COMMODORE 8000 ☐  
Printer/plotter (200/300)

COMMODORE 8000 ☐  
Printer/plotter (200/300)

# g 1/10th of your brain?

And for hard copy, there are our four printers and a printer/plotter. These will preserve on paper—in colour, black and white, chart form, graphic or text, the fruits of all your labor.

Finally, for more exciting games, there are joysticks and paddles.

So use your brain. And make sure you use all of your computer's brain.

FOR FURTHER INFORMATION, BOX ONE (OR MORE) OF THE 8000S ABOVE, AND SEND TO THE COMMODORE INTERNATIONAL THUNDERBOLT MAILING CENTER, 10000 WILLOW PARK DRIVE, CANTON, OHIO 44705.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_



**commodore**

COMMODORE

HIGH STREET

# Taskset & Commodore 64

POSTER  
PASTER



NEW



Commodore \$6.90  
Disk \$9.99  
Incredible Wordcraze



PIPELINE  
GYROFIRE



Taskset Ltd

13 HIGH STREET BRIDLINGTON YO16 6PR

ACCESS ORDERS (0822) 872200 IN 10CETS

Dealer enquiries welcome 0262 680688

TASK SET!

THE NEW SOFTWARE!

Data view  
address

I shall be grateful if you could correct two points — first both the products mentioned in the news item are published by a same company: Dataview Windows Ltd and not separately the address of Dataview Windows Ltd is: Raddle House, East Street, Colchester, Essex. Telephone No (0206) 654414  
Ann Ray  
Marketing Manager  
Dataview Windows Ltd

Ernest A. Edwards  
Waldenfield  
Cincinnati

project, a highly  
 Mr. D. Bushgren  
 West African  
 ALL Communications Monitoring  
 Software File programs are  
 received in cassette, loaded,  
 checked, printed out, and the  
 printed is reproduced  
 photographically. This  
 doesn't leave much room for  
 mistakes, says Mr. Bushgren.  
 He's avoiding this, perhaps  
 one of his responsibilities will  
 involve this in the

**Castlepoint club**

All BACE-cases of Commander Hovgaard, apart from the first, over 60 years old, are available from our online database <http://www.foi.no>.

Merge solved?

On the left carry out the following: — Load of type in last version of program, then enter in **CARACT NAME**, **FILE#1**, **FILE#2**, **FILE#3**, **FILE#4**.

## Mister Angry

MSA 1580 purchased some magazine like some models. I decided to try some of your programs for my V-30. Having spent a number of hours typing and checking they still aren't right. I have checked them over and over again and I am 100% sure that they are as they appear on your magazine. I have tried them on three computers and all I get is a mass of symbols on the screen.

Blush  
blush

Among the routines listed are 'MERGE', 'RENUMBER' and 'DELETE'. At a cost of £5.95 this represents a much greater value than any software package, particularly as there are many other useful routines in the book.

**W. J. L'Amour**  
Durham, U.K.



## Making micro music

THE CAPITAL Region Information Centre, part of the Micro Electronics Education Program, is producing a booklet for music teachers and students entitled "Microcomputers and Music Education".

Following an introduction to the subject, the booklet will contain a list of useful software and hardware currently available, with a full section on the Commodore machines.

Organiser Nick Pollard said that despite the Commodore machines not being approved for use in schools by the Department of Educational and Electrical Engineering at the latest London Education Authority, any information on the subject would be gratefully received.

To contribute information or get hold of the booklet—which should be available in September, contact Nick via the Micro Department, Middlesex Polytechnic, Telford Park, Cockfosters, Herts.

## Mermaid launches disk doctor

NEW COMPANY Mermaid Software has launched the first of a range of educational and utility programs.

Download, its computer disk with the 1541 disk drive and all 24 format disks including the Prodrive (1708).

It's a disk repair program which will restore corrupted data, recover data from disks with slight physical damage, and allows the data to be saved on a new disk which is given its identical header.

Informant's Harold Wolpin describes the utility as "an invaluable ability to rescue disk users saving hours of work in cases where disks are damaged as soon by moment use".

Download comes with a free disk disk as well as the main

GAME CREATOR, from Microsoft, is the latest in a line of programs designed to be non-programmer producer games.

Launched in the PCW show, the 64 Games Creator is written by David and Richard Dackiw, authors of the Galactic Games Designer for the Vic 20.

Games Creator comes with three games ready to play, Russian Hunt, Patrol and Snake Fix, which cover most platforms, and Scramble-type exercises. The program is menu-driven, and allows you to specify the type of character, movement, graphics,



Backgammon, shooting, rules, sound effects, menus, sprite shapes, explosions and so on. Microsoft's Jan Mack

creator commented "Games design languages like BASIC Scope are excellent in their way, but for users who don't want to learn a new language we've put together Games Creator. We think it will be a big success with games players of around 12 years old and upwards, but we're also found that it's a help to more advanced programmers who want to try out games ideas before writing original programs".

Games Creator costs £12.95 on cassette and £15.95 on disk. Contact Microsoft, The Microsoft Group, Watlington Circus, London.

## Eureka! — £25K reward

EUREKA!, an epic arcade adventure from new company Demark, looks likely to set new standards of complexity — and there's a £25,000 "reward" at stake for the first person to complete it.

Demark's Wherry — grandson of author Dickens — and Mark Strachan have set up the company with the intent of "blending the talents of many people into works of art". Eureka! consists of five adventure games, written by Fighting Fantasy author Ian Livingstone, and five arcade games. All the coding has been done by the Hangman's programmers of Andromeda Software.

The game is released in a single £14.95 package on Coder's Box, and any mail orders made before the date will have a guaranteed delivery date, so as to give the chance to all purchasers. Eureka! will be released to shops at a later date.

The epic contains around 120K of coding, and operates on a menu-based principle. Completing each arcade section allows access to the next part of the adventure, which is set in five different periods of history — Pre-historic Britain, Roman Britain, Celtic Britain, World War Two Germany, and the present day Caribbean.

Your mission is to find the shards of a shattered moon crystal, and the reward of

£25,000 will be paid to the first person to achieve this.

Demark's Wherry said "we're keeping future plans fairly secret, but some of my programmer's friends would lend themselves well to computer games, and we might also do something based on a picture character. There's very little limit to the ability of Andromeda Software's programmers".

Contact Demark through Taurus PR, 127 Fower Park Road, Putney, London, phone 01 871 1126.



Download — available



Wherry & Strachan — per e



## Elite on the street

NEW SOFTWARE company Elite have plans to dominate the Christmas market with two games releases based on US television series currently popular in the UK.

Elite's first release, the stylistically named *Kojanote Wolf*, is a multi-screen arcade adventure in which the hero has to recover all the pieces of the missing Dragon Armour. There are over 60 screens, and the program is being marketed as a rival to the popular Jet Set Willy.

Elite's forthcoming releases are licensed from 20th Century Fox and Warner Brothers, and

are based on the TV series *The Fall Guy* and *The Duke of Hazzard*. Elite spokesman Steve Wilson said: "We think American programmes are a better bet than British ones, since they retain appeal to the same sort of people who play computer games. Although these titles have been licensed from America, the software is British. We're hoping that *The Duke of Hazzard* will be the Christmas number one game."

Elite games for the 64 will cost £6.95 on cassette and £1.95 on disk. Contact Elite at 35, Bradford Street, Walsall, 8952 61121.



*Kojanote Wolf* — getting the jet set Wolf

## The Cheetah, the RAT and the Interpod



*Interpod* — used by Cheetah Marketing

PACIFIC ELECTRONICS, one of the UK's leading electronic sub-contractors, has taken over the sole marketing and manufacturing rights to Interpod, the multi-part interface for the 64 and Vix devices put by Oxford Computer Systems.

OCS has recently experienced financial problems, and though the future of the compiler software for which the company is best known has not yet been decided, Interpod seems safe. Pacific will be marketing the unit, which

provides BASIC and FREE interface hardware, through Cheetah Marketing, another recent independent. Price will be £25 to £39.95.

Cheetah is best known for a range of software and hardware for the Spectrum computer, but CTM's related products are in the pipeline. The first will be an enhanced catalogue package, R.A.T., which is designed to have loaded up impressive professional artists, with the launch set for the start of September.

# The computer game is DEAD...



## Words for free

**SOFTWARE** Publisher Daveview Workbench Limited, producers of the Wordcraft 64 program, has produced a free eight page brochure summarising the benefits of word processing.

The full-colour booklet explains in straightforward terms some of the points associated with the subject, and deals with the ways in which wordprocessing can make it more money for small businesses.

For your copy, write to Anne Ray, Marketing Manager, Daveview Workbench Limited, Route House, Road Street, Colchester, Essex CO1 2NB.

### 1. Write 2. Store 3. Retrieve



Wordcraft is a standard

## Stack cuts cartridges



Stack's motherboard and programming disk

**COMMODORE** software and hardware producer Stack Electronics has cut the price of its Programmers Aut cartridge for the 64. The series of cartridges provide utilities such as Basic translators, text tape operations, and two pass assemblers. The cartridges are recommended for use with Stack's four slot motherboard.

Also newly announced is the Stack 180 series cartridge based compiler. Priced at £14.95 including VAT, it's intended to achieve more professional programming through speeding up Basic software.

Contact Stack at 560-564 Derby Road, Basildon, Liverpool, L20 9LM, phone 021 553 2011.

## Cumana talks tape drives

**DISK DRIVE** manufacturers Cumana, previously best known for its Dapple menu processors, will launch a "floppy tape" drive for the Commodore 64 and Vtc 20 in October.

Developments engineer Carl Adams described the system as being "similar to the Wide-drive system available for the Spectrum, but a totally independent design."

The floppy tape system works using tape reels containing 5000 bytes of tape. Various lengths of tape will be available in the early versions, with a full foot tape costing around £1 and having a 10K capacity.

Reel price should be about £100, with an option of connecting another drive at a lower price, as yet unspecified.

The enhanced processor will allow the Cumana drive to be controlled directly by the Commodore machines with no special interface.

Contact Cumana at Pines Trading Estate, Wood Street, Colford, Dorset, GU1 1RH, 0401 505128.

# ...LONG LIVE

# Eureka!

250K of pure mystery. Be the first to know.

Send your name and address to: Eureka!, 228 Munster Road, London SW6 6AZ



# AMERICAN

THE BEST OF AMERICAN VIDEO GAMES



**Boulder Dash**  
 You need strategy and planning to beat the Physics 16 levels scrolling across the screen. (Bonus Power) combinations. Limited lives. And time.



80 Screens



48 Screens

48 Screens  
 Play in the Dark!  
 10 Players and more  
 with  
 Sex School!

NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_  
 STATE \_\_\_\_\_  
 ZIP \_\_\_\_\_  
 PHONE \_\_\_\_\_  
 E-MAIL \_\_\_\_\_  
 I would like to receive more information about \_\_\_\_\_  
 (Please print name and address clearly.)

YOUR COPY IS AVAILABLE NOW!



ORDER, PLEASE

YOUR COPY LIMITED INVENTORY AND TECHNOLOGY CENTER.  
 DESIGNER LIMITED STEVENS, TEXAS  
 TELEPHONE 944-4444



# "I'll swap four of my tapes for your Activision."



You know the feeling. A couple of plays and the best you can hope for from so much of the software around, is swapping it for something better.

Well, the something better has arrived. Activision.

One thing you can be sure of. Buy any Activision software and you'll find you're walking, slapping, bang into a totally new experience. One that lasts.

See the first titles in your usual Commodore software store now.

BEAMRIDER · DECATHLON · H.E.R.O · PITFALL · TOY BIZARRE · ZENJI



**ACTIVISION**  
Computers were made for us.

# THE BEST SOFTWARE IN AGES

C-64 ☐ SPECTRUM ☐ BBC ☐ ELECTRON ☐



## FANTASIA DIAMOND

Delve deep into the age of fantasy with one of the most popular and exciting games of the decade. Dive deep into the age of fantasy with one of the most popular and exciting games of the decade.

Review the magnificent Fantasia Diamond, a game that will take you on a journey of discovery and adventure. Dive deep into the age of fantasy with one of the most popular and exciting games of the decade.

For more information and to purchase your copy of Fantasia Diamond, contact your local computer store or write to: **HEATHROW ATC**, 10000 E. 1st Ave., Suite 100, Denver, CO 80231.

SRP \$7.95



## HEATHROW ATC

Now challenge the age of technology to its limits. Dive deep into the age of technology with one of the most popular and exciting games of the decade.

Review the magnificent Heathrow ATC, a game that will take you on a journey of discovery and adventure. Dive deep into the age of technology with one of the most popular and exciting games of the decade.

For more information and to purchase your copy of Heathrow ATC, contact your local computer store or write to: **HEATHROW ATC**, 10000 E. 1st Ave., Suite 100, Denver, CO 80231.

SRP \$7.95



**HEATHROW CONSULTANTS**

10000 E. 1st Ave., Suite 100, Denver, CO 80231



## 3D LUNATIC ATTACK

Now challenge the age of technology to its limits. Dive deep into the age of technology with one of the most popular and exciting games of the decade.

Review the magnificent 3D Lunatic Attack, a game that will take you on a journey of discovery and adventure. Dive deep into the age of technology with one of the most popular and exciting games of the decade.

For more information and to purchase your copy of 3D Lunatic Attack, contact your local computer store or write to: **HEATHROW ATC**, 10000 E. 1st Ave., Suite 100, Denver, CO 80231.

SRP \$7.95

\*No graphics on these screens.

Software and games available from Heathrow Consultants, 10000 E. 1st Ave., Suite 100, Denver, CO 80231.

HEATHROW

Consultants

10000 E. 1st Ave.

Suite 100

Denver, CO

80231

HEATHROW

Consultants

# THE CHIP SHOP

## — sending software on the airwaves

*A new Radio 1 computer show and a revised Esperanto for micros — Trevor Teyler explains all to Chris Jenkins*

THE "BROADCASTING" of software — now a familiar concept due to the growth of networks such as CompuLink and MicroNet — is also possible in a much more direct form. Broadcasting audio signals on ordinary radio wavebands is also possible, though Trevor Teyler met with some scepticism when he first floated the idea.

"At the time I was working in BBC's tele-visuals, and it occurred to me that if home computers could transmit on ordinary domestic wavebands, which are fairly good in quality, considering the quality of our broadcast chain is high we should be able to broadcast software. On *The Tomorrow's World* we often reported on other people's inventions, and I thought it would be a good idea if we did some interesting ourselves."

Teyler's idea was to broadcast ten seconds of audio signal which viewers could record and load into their computers. "The producers wanted to keep down the amount of this horrendous noise, and decided that ten seconds was all an early evening audience waiting for the Top of the Pops would tolerate — though there were those who thought it was better than some of the songs Top of the Pops was putting out!"

### Simulation

Though some experts had advised Teyler the system wouldn't work, and others thought it would, the only way to find out was to try it. First one-second programs, for the Apple and the ZX80, were to be transmitted, though everything did not go as planned. "The transmission, on December 1982, was live, and of course it wasn't possible to rehearse it. It didn't work in the studio, because we set up a simulation of the program the viewers should have picked up, but the presenter failed to read the tape back to the team. As a result the studio chain didn't work, and we passed on to the next item. However, the broadcast transmission worked fine! Before the programme was off the air we started getting phone calls asking us that the program worked, and by the following Monday we had hundreds of mail, many of the letters including listings of the program. The system proved to be fairly robust,

many people had just placed a microphone in front of the TV loudspeaker, following the instructions in the Radio Times."

The program, written by Teyler, explained the reason to type in his name, which then appeared along with those of the *The Tomorrow's World* team in a scrolling credits display. It was a fairly simple test, and the big problem was that the program had to be machine specific.

"I then discovered that the Dutch network NOS had been doing this for some time, and had been working on Benelux, a system by which you could run programs on a wide range of computers. The demand

for more useful programs which had been generated by the *The Tomorrow's World* transmission gave me the idea for *The Chip Shop*, combining the ideas of transmitting software typically and banking as well as text as well as hardware."

### Beneluxcom

Teyler travelled to Holland to talk to NOS, and found that the Dutch program Beneluxcom had been transmitting software designed to appeal to electronics hobbyists. "They tended to be interested, and *The Chip Shop* wasn't going to be the sort of program. Beneluxcom, the signature of computers, was developed by an MOS technician, a Philips engineer and a programmer with the Dutch equivalent of the Open University. The first version of Beneluxcom had a lot of problems, many of which were overcome with Beneluxcom 2. We're now announcing the release of Beneluxcom 2+ in September, upgrading Beneluxcom 2 in two areas, firstly on the number of machines it supports, and secondly in the look of it — there are now more on-screen prompts."

The Dutch Beneluxcom always allowed for the Commodore computers, but not for the less popular Sinclair Spectrum. Beneluxcom 2+ now covers the Commodore 64, the Vic 20 (plus 40), and the MOS65, 4000 and 8000 series machines, as well as many other popular models including Acorn, Fero, Sanyo, MSX, and so on.

"We've also revised the manual, putting it through our traditional editor so that it's consistent. The interesting thing is it



Trevor Teyler — "There should be much more computer coverage"

# Computerma6t

the source

[illegible][illegible]

**COMMODORE 1341  
DISC DRIVE**

Now at just \$199.95  
you can get a  
reliable, high-speed  
150K 5 1/4" floppy disk drive  
for your Commodore 128 or  
6400.

Available in several configurations:  
• 150K 5 1/4" floppy disk drive  
• 150K 5 1/4" floppy disk drive  
• 150K 5 1/4" floppy disk drive  
• 150K 5 1/4" floppy disk drive

**\$199.95**

**DEAL**

**ONE**

**COMMODORE 1541  
DISC DRIVE**

**1550**

400K 5 1/4" DISC IN UNIT (10)  
1541C  
1541D  
1541E  
1541F  
1541G  
1541H  
1541I  
1541J  
1541K  
1541L  
1541M  
1541N  
1541O  
1541P  
1541Q  
1541R  
1541S  
1541T  
1541U  
1541V  
1541W  
1541X  
1541Y  
1541Z

**DEAL  
TWO**

**QUICKSHOT II**  
Deluxe Jettable Compressor  
**BIO95**



**50¢**

**FREE**

With  
this  
calculator  
you can  
get the  
answers  
you need  
fast.

For more information, call 1-800-4-A-Chart.

**computer**



"That part of the licensing deal with WGBH is that we are required to produce *Raincoast* at no profit. That's why the book and the cassette cost only \$2.95, which is our production cost, and why it's sold through the Broadcasting Support Service, which is a non-profit making registered charity."

The first series of *The Chip Shop*, hosted by popular TV personality Barry Norman, took some of the BBC programs and tried to establish the sort of software radio listeners wanted.

"The general reaction was that people weren't too interested in games — they wanted useful programs, though they didn't always tell us what they meant by 'useful.' For the new series we're looking to broadcast programs which recognize the demand — they either perform some function which allows you to calculate something, or they're instructive in some way."

Terence maintains that the demand is greater to use an electronic than *The Chip Shop* makes the younger audience — "The last program we transmitted included a questionnaire and from the replies we think the age range covered is very broad — young men to pensioners. *Raincoast* is not very good at doing games at all — even the graphics and sound capabilities have to be cut to the lowest possible denominator."

Possible future plans include building up a regular radio life, putting out a program each night which listeners can use as building blocks for larger programs.

## Radio 1

One disadvantage of the first series of *The Chip Shop* was that the well-meaning but ill-informed at a different time to the editors of *Radio 1*. "The software was transmitted at 23 minutes past midnight, four nights a week on Radio 4, principally because we couldn't broadcast for very long at peak times. It caused problems in

that many private listeners couldn't stay up that late to catch the signals, so we're now partially overcoming the problem. The new series, starting in September, will have the software transmitted early in the morning, on Radio 1 starting on 20th September at 0530. The transmissions will be repeated the following Saturday at 0155. We think it's usually more acceptable to get up early rather than to stay up late."

## Independent

Even though licensing fees for the last series are about £1 million, and with the addition of the Radio 1 slot for the new series the figure should double, the software transmitters can't quite justify being treated as peak time. Even Radio 1 listeners to the new slot on Saturday mornings, at 1.20 to 7.45am, wouldn't stand for it! The new 12-month slot in the Mark Peggitt era, presented by David Footman, will give a few brief computer news items and plug the *Raincoast* transmissions on the following day. The Radio 4 *Chip Shop* will still be presented by lovely Barry Norman, though Radio 4 will no longer be transmitting the software.

*The Chip Shop* suffers from the disadvantage of being a BBC programme which must demonstrate independence from the BBC computer. "It's a potential battlefield for us to go on air and criticize a machine, because we'll be accused of biasness towards the BBC. For that reason we did very little about hardware specifically in the first series."

Terence maintains the BBC computer is being produced by an entirely separate company. "I think it's very important that the BBC's commercial interest in one machine should have no effect on the editorial content of *The Chip Shop*, and there's been no pressure put upon us to plug the BBC machine. It's up to us to maintain the integrity of our independence."

Partly for this reason *The Chip Shop* tends to concentrate on applications rather than "how to." "As far as the Commodore machines are concerned, I don't feel there's any need to wave a British flag — if the machines are interesting we'll take a look at them, and if they're good we'll say so."

"We're also in a very difficult position to a computer magazine, because we have to appeal to an audience which has not necessarily reached out because they're interested in computers. Finally the magazine is in a much better position to do reviews of new equipment than we are — they can devote several pages to it, with pictures, whereas I may only be able to put a two or three messages."

## Format

The new *Raincoast 1-4* has been developed by *The Chip Shop's* own software engineers with the extensive cooperation of the manufacturers of the machines involved. "We also sometimes contract outside programmers for particular jobs."

The new *Raincoast 4* series features a letter spin-a-round format for news headlines, and thirty-second reports from Tokyo and

California. "Aside from that we're sharing very much with the successful format. There are a couple of specials the first of which is our second week on the air, the 22nd of September, when we're planning a very large scale broadcast from the PCW show in Olympia. We'll have a big stand there and we'll be organizing a number of events which will be recorded and edited for supply. One feature is an All Stars spot in which a panel of industry celebrities will be available to answer audience questions, with special features on small businesses, journalists and so on. The other special we have planned is a live studio broadcast from Newcastle — a sort of Silicon Glen report — and on the 2nd and 9th of November we hope to be live from Tokyo. Though that's not yet confirmed."

*The Chip Shop* consists of Terence, plus two production assistants, a reporter, a researcher, a software engineer, a reporter clerk and the two presenters Barry Norman and David Footman. The three of them in the BBC's Langham building — soon to be demolished to make way for a new broadcasting centre — are packed with computer equipment and stacks of software and press releases. With 120,000 letters generated by the last series, it's amazing that there isn't more time and labour devoted to computer programs.

## Response

"For the first two weeks of transmissions we topped the request charts — people were clamouring for the *Raincoast* but *Raincoast* itself is now published except for the program, through a couple of magazine articles and is fast on its way. We couldn't afford to address *Raincoast* through something like the *Radio Times*, due to the expense involved, but we're still looking at various ways of publishing it — we're keen for people to fill in order forms rather than just write to us, since we're anxious that people know exactly what we're offering. All BBC programs will have order forms, and we're going to try to publish some sort of periodical — but weekly half-pages in the *Radio Times* would cost tens of thousands of pounds."

For the moment you should contact **Broadcasting Support Services, P.O. Box 7, London W3 4NJ**, for more details on *Raincoast*. Each pack contains a manual explaining what *Raincoast 1-4* is and what it can do, how to write *Raincoast* programs, and how to load broadcast software. The center includes translation programs for all the machines covered — you just load up the one for your machine, and tune in to *The Chip Shop*.

Future plans may include *Raincoast 1*, which may handle sound and graphics better — and a TV series? "I think there should be much more computer coverage — more radio programs covering more specific subjects, as a TV series — but I don't feel there's space for *Raincoast* programmes on TV. Television would be a natural progression, and the broadcasting of software is only one part of what we're doing, and not necessarily the most important part — it's just the one which has caught people's imagination."



Barry Norman — *Raincoast 4* is on

## Mega-zap



TITANLORDS OF '80' set women like nothing better than a "Mega-zap" good mega-zap!" — so here's one. Data 1 from the very variable Megazap is planned to be a version of an American arcade game, brought out in software before it hits the arcades. It's programmed by Mike Winkler of Rio Ant Game.

Forgetting the tedious details of solar-powered positron accelerators and Zanzibar defence spheres, what you're left with is a "through-the-midway" scene of various effects. The screen radiates colours as your pod's status as you fight off the badies, which manifest themselves in waves of various numbers and shapes, including the good old Shooting Emergency.

There's not much more to say about Data 1 — it's very straightforward, with some good sound effects and excellent scrolling backgrounds. A good bet for future releases.

Program: Data 1, 64  
Supplier: Megazap, 96 Rogers Street, London  
Price: £7.95

Graphics: 7  
Sound: 3  
Control: 5

## It's magic



WYE VALLEY SOFTWARE'S *Magic* was something in Winkler's Jet Pac, of the object of the game is to fly around the screen picking up bonuses and depositing them safely. There the similarity ends, as that *Magic* depicts you as a cloud riding wind rather than a jet-powered space-man. The forces of Evil are out to stop you, and to combat them you must fly magical lightning bolts and collect skulls, gems, from 'his' and so on to pop in your pot. A bubble message is projected onto the pot when your time is up. A good game, the only reservation being that each of the four screens is broadly similar. Still, well worth having.

Program: Magic, 64  
Supplier: Wye Valley Software, Farnham House, Esher, Hampshire

## \* Soft \* \* Hits \*

*The good, the bad  
and the ugly reviewed by  
our hard-playing team*

Price: £6.95  
Graphics: 7  
Sound: 6  
Control: 6

## Gothic, novel



THE EVIL DEAD is the first release from the darkroom Palace, and has received a lot of media attention due to its association with the splatter movie of the same name. Fortunately the game itself is all good healthy fun, and though there aren't any great surprises it's the kind of thing which can keep you playing for hours.

An unsavoury Mark replaces the scenario, a force of evil hordes swarmed from above, in which you must protect your four friends and yourself from attack by the spirits of the Evil Dead! Various weapons can be picked up to help you in your fight, but beware! powered humans split into four firearms segments.

The bands to avoid dismemberment, is

fun and famous, and overall Evil Dead is an excellent debut from Palace Software. Great spooky Gothic music too.  
Program: The Evil Dead, 64  
Supplier: Palace Software, 271 Piccadilly Rd, London  
Price: £6.95  
Graphics: 7  
Sound: 7  
Control: 8

## Half and half



WITH STRATEGY and simulation games rapidly overhauling thought about "sea" in the popularity polls, it's no surprise to see that some of the best games now coming out combine elements of both themes.

Clash *Banks of Midway* from PWS and you'll see a perfect example. The game is a combination of the crucial WW2 USA/Japan action engagement. The manual — which I've only skim in preliminary tests — explains that although the game is not really complex, it needs some study. This is good. The main screen shows the deployment of various air and sea forces, and you use your cursor to direct the movement of your US forces. Your task is to defend the island of Midway and halt Japanese attack carriers.

All an attack on the island is depicted with a short-time arcade sequence in which the planes zoom through the air trying to avoid your tracer fire.

A short movie like this cannot serve to give anything other than a brief idea of what promises to be an outstanding game.  
Program: Banks of Midway, 64

## Full steam ahead



A TONY COUNTRYMAN spectacular, Lord Chamberlain will immediately at a glance. The top section of the screen depicts an old-time locomotive chugging across a beautifully-detailed background, while the lower section gives a view of the railway.

Using the joystick to control the loco, you must avoid explosive holes, collisions, and

attacks from aircraft and saboteurs. Thanks to the screen and the game, you, too, you must make it to a refuelling depot before you proceed to a halt and become a sitting target.

Wonderful music ripped off from John McVie's Dave, and attractive graphics (not outstanding, but well-designed), make *London* a winner. One of the rare cases where the box description doesn't give an erroneous idea of the game, and there are screen shots

too.  
Program: London, 64  
Supplier: Adigata, 175 West Street, Sheffield  
Price: £7.95, ask £11.95  
Graphics: 7  
Sound: 8  
Control: 5

**Supplier:** PDS 452 Stony Stratos Road,  
Century  
Price: £9.95 coin, £10.95 disk  
**Graphics:** 7  
**Sound:** 6  
**Gameplay:** 9

## Psycho 8K



**PRODUCING** games for the 8K. We're difficult. Producing good games for the 8K is very difficult. Producing them at £1.99 must be near impossible. Masterzone has done it with Psycho Shogun. Sorry if the sounds aren't like an advert that's a screw, but that's the way a good salesman.

As you'll see from the screen shot, the graphics are clearly far respectable, and there are four screens — although it's as hard to get across the busy road as rivers one that I haven't got any further. Hazards include vicious Gnomes, deadly traffic and runaway manurecarts, and pedestrian Arthur never collect gold coins on the way to the supermarket.

A goodie, and a clear improvement on Masterzone's first batch of games. Let's hope there are more to come.

**Program:** Psycho Shogun, 8K + disk  
**Supplier:** Masterzone, 48 Gagea Street, London  
Price: £1.99  
**Graphics:** 8  
**Sound:** 5  
**Gameplay:** 7

## Take a fall



**THE ORIGINAL** and genuine, and not the best design or memorable situations. But all by American efforts hours of play for the dedicated joystick buster. As Fallin' Harry you race through a seemingly never-ending jungle avoiding noobs, car pots, alligators, fire, traps and quads, searching for treasure and trying to beat the 30 minute limit.

The one really is a classic, though it sets up new highs for graphics and sound. Strategy and timing is all, and there isn't a proven accelerating hyper-blaster in sight, thank goodness.

**Program:** Fallin', 44  
**Supplier:** American  
Price: £9.95  
**Graphics:** 8  
**Sound:** 5  
**Gameplay:** 9

## Go West



**YET ANOTHER** new company, Talma, and another interesting range of products.

**West** is a fast adventure with graphic capabilities set in 1984. You are on the track of a gang of robbers. The usual adventure conventions are adhered to, and the vocabulary seems to be good, around 200/300 words.

There are a few oddities — in daylight, if you don't type "SHOOT" quickly enough, your life isn't worth a played model. There's also a screen where you play postcards with the robbers, and an odd device by which if killed you return to the start, and will eventually find yourself standing over your own corpse.

Looks graphics, drawn with Talma's Pacman system, but only the one could tell them from more West would have been even better.

**Program:** West, 44  
**Supplier:** Talma, Cannon Building, 181 St James Road, Glasgow  
Price: TBA  
**Graphics:** 8  
**Sound:** 5  
**Gameplay:** 6

## Pigeon pie



**ANOTHER** new company, Grendel Graphics, has produced Pigeon Pie. Like Alpha's Last of the Time Crawlers, and like Louis 4's falling. Pigeon the pigeon flies through a smooth-looking landscape of modernism, computer ships and castles, picking up wings to add to his nest. Casts, fences, lampposts, planes and twin-sightseeing airplanes serve to break up the action, and Pigeon strikes back with revving airplanes. Nice easy music and nice levels of difficulty. Look out, Jeff Mower, the pigeon are coming.

**Program:** Pigeon Pie, Pigeon, 44  
**Supplier:** Grendel Graphics, Alpha House, 30 Curry Street, Sheffield  
Price: £7.95  
**Graphics:** 7  
**Sound:** 5  
**Gameplay:** 9

## Ice scream



**I'D HAVE THOUGHT** that Ladder and...  
*(Continued on page 27)*

## An up-and-under



**FRANKLY** more space than the most of these programs come from the good old 16/32 of A. Seemingly Flip & Flop has a new look at perspective graphics programming. Seemingly is a new company which is licensing US games and adding a fan-leader and new packaging. The results should be excellent.

Flip & Flop is set in the Zoo of the

future. You play two characters, Flip the Kangaroo and Munch the monkey. As is various Q\*bert dimensions, you have to jump from block to block until you've stepped on each section of the first zoo platform. Then the game does an amazing flip-flop, and you find yourself at Munch the monkey hanging underneath the platform. Later stages involve flying cars and angry zoo-keepers.

Great music (flurry of the Gladiators), side sound effects, go out and buy it.

**Program:** Flip & Flop, 44  
**Supplier:** Seemingly, Business & Technology Centre, Beaumont Drive, Stevenage, Herts  
Price: £10.95, Ask forthcoming at £10.95  
**Graphics:** 9  
**Sound:** 9  
**Gameplay:** 9

# VIZASTAR 64

## THE INFORMATION PROCESSOR

■ Spreadsheet

■ Database

■ Graphics

- Extract from your information files and include them on the worksheets for easy, portable, calculations and easy reports
- Access an unlimited range of your information records

- Add to records using form and records worksheets to re-organise your existing information records
- Records up to 1 000 characters long with 256 colours and 320 lines

- Supports virtually any printer: IBM PC/XT, IBM PS/2, EPSON, OLIVETTI and many others
- Portable printer support: IBM's low-cost dot-matrix

- One word processing for every feature of features
- The single word processor and printer format the worksheets giving an easy on-screen display

- A 1000-form by 84 Columns wide format with large margins, inquiry and edit mode
- Extensive use of Windows allows you to move one part of the worksheet while working on another

- Advanced spreadsheet features: multiple individually variable column widths, pivot tables, a powerful graphical data analysis range of built-in functions

- Worksheet management: fast and easy Search, Sort, Copy, Move, Delete and Insert by row, column or a range
- Worksheet features for letters, contracts, report headings etc

- Include information directly into the Worksheet from VisiWrite and almost any other program
- Simultaneous display of work sheet and low to four graphs

Visastar integrates three important electronic aids to your business or home office. A fast and easy-to-use package - Visastar is a comprehensive information processor that includes an electronic worksheet, information filing system and several unique on-screen graphics.

Visastar has been designed to incorporate the very latest in user-friendliness - so now you can handle your all-important information in many new ways and in a quick and effective manner.

The information filing capabilities of Visastar enable you to store your information onto disk in

an ordered and instantly retrievable form. This means that you can quickly pick out individual or entire groups of related information to create lists, statements, labels or reports.

Visastar is the **ONLY** program of its kind on the Commodore 64. Completely consistent with the VisiWrite word processor, Visastar provides a totally comprehensive office system.

Visastar costs just £99.95 (incl. VAT) from your computer dealer and selected stores. Please write for more details and the name and address of your nearest dealer.



SOFTWARE

VIZA SOFTWARE, 9 MANSION ROW,  
BROMPTON, GILLINGHAM, KENT ME7 8SE  
TEL: MEDWAY (0634) 813380

Dealer enquiries welcome

AVAILABLE NOW: VIZASTAR 64  
**£99.95**  
(incl. VAT)

platform games would have had their day by now, but Amiga makes its entrance as otherwise **how far Hunter**. The scenario is unusual — how many other games can you name in which the hero is an Islamic warrior on a postcard to Commanders Computing International? The hero, Thorak, has to traverse the caverns in search of the blocks, which have to be carried to the exit by his waiting dragons and mutant soldiers try to stop him, but can be killed by dropping blocks on their heads or punishing them with the help of a Power Pill. Many Amiga games are expensive — this doesn't happen to be one of them. It's a fair game for all that, and one of the best of its program could do a lot worse.

**Program:** Ice Hunter, 44  
**Supplier:** Amiga, 8 High Street, Booter, Surrey  
**Price:** £5.95  
**Graphics:** 5  
**Sound:** 3  
**Control:** 4

## Space squaddie



Within the Cliveden Hamstead of 44 Games Book Lane, the Parloids-powered Star Trooper is another mega-rapper, marketed as far as I can discern to Hunter's Starship Trooper. The last name must get that was the Ocean's offering last month, and not of remarkable graphics. Armed only with a jetpack and a laser you fly around encountering ships, and try to do with a membership in cyberspace your last. Not bad.

**Program:** Star Trooper, 44  
**Supplier:** Midwestern House, Castle Yard House, Castle Yard, Richmond  
**Price:** £3.95  
**Graphics:** 5  
**Sound:** 3  
**Control:** 5

## Bombs away



FOR THOSE of you who have never experienced the a flight simulator for the

148C, here it is. Bombs Away is based on the mechanics of the machine. Bombs Away is modified — good colors, interesting screen display, plenty of updates and a challenging game.

You pilot a WW2 heavy bomber, and must select a target and a weapon load before taking off. The joystick and function keys are used for steering and control of bombs and flaps. Attacks by enemy fighters, which can be shot down using your radar screen, can cause instant destruction or simply a fuel leak. As with all good flight simulators, after attacking the target and flying home you have the hardest part — landing!

**Program:** Bombs Away, 148C  
**Supplier:** Commodore  
**Price:** £4.99  
**Graphics:** 5  
**Sound:** 3  
**Control:** 4

## Think political



**DISTRIBUTOR:** AmigaSoft has set up a division called Disapines, which seems to concentrate (just) on disapplying strategy games rather than on politics. First offer can include **Power Quest** and **Electron Trek**, which is a simulation of the American elections. The game, for one or two players, is menu-driven and features convincing map displays. Food money opinion polls and hidden voting features affect the outcome, and after 20 epochs each side the votes are counted and the result declared.

Intending to be a company dedicating itself to more intellectual games, Electron Trek is a particularly good bet if you have ambitions to be the next Ronald Reagan. **Program:** Electron Trek, 44  
**Supplier:** Bush Games, AmigaSoft Group, Richmond Road, Booter  
**Price:** £7.95, disk £9.95  
**Graphics:** 3  
**Sound:** 3  
**Control:** 4

## On the run



ONE OF MANY compilations of address

numbers currently available for the 44 — including Disapines's Micro Olympics and Hunter's Daily Thompson's Disapines — the AmigaSoft version of the Olympics. Based on the weekly Track & Field, Disapines features all events, including shot, discus, javelin, long and high jump, shot put, discus, javelin and pole vault.

Each event is represented in marvellous graphics with top-class animation. The only possible criticism is that the method of joystick control is very awkward — you have to wriggle the stick back and forward to make your athletes move. Admittedly I can't think of a better method, and all the Olympic games have adopted it, but it's a pity.

**Program:** Olympics, 44  
**Supplier:** AmigaSoft  
**Price:** £9.95  
**Graphics:** 5  
**Sound:** 3  
**Control:** 4

## For mutant camels



**ANOTHER** from Talon is **Kalah**, supposedly based on a traditional Arab game. It presents you with two sets of six 'pots', with a target pot at each end of the two rows. Each of the 12 small pots is filled with a number of beans and the aim of the game is to move the beans from pot to pot until you get some adverse numerical advantage.

Not graphics and music do not a good game make, and Talon would be better advised to update Atari's Tising them a good bet to future.

**Program:** Kalah, 44  
**Supplier:** Talon  
**Price:** £14  
**Graphics:** 4  
**Sound:** 3  
**Control:** 4

## MORE NEXT MONTH!

SOFTWARE COMPANIES — send your latest releases to: SCOT HITS, Commodore (AmigaSoft), 12/13 Little Newport Street, London WC2R 1LD.



You sh  
my rapid  
I shooie

In the shops  
from October 19th

# CLIFF HANGER

AUTHOR - JAMES DAY ORIGINAL MUSIC - JULIAN DOE

Thrill to the cartoon style action of Cliff Hanger, a really original, Wild West game. As Cliff the hero, you've got to stop the bandits shooting up the canyon. But with its own brand of wacky cartoon action fun, things simply aren't as they seem in

Cliff Hanger. For a start, the boulder you throw at the of bandits may just come bouncing back at you.

Cliff Hanger incorporates all the elements that have made New Generation games best sellers for the Spectrum, such as original ideas, superb graphics and hilarious happenings - but now it's available first for the Commodore 64.

Featuring 50 separate screens, three levels of difficulty, one or two players scoring, Hall of Fame and joystick compatibility or user defined keys, Cliff Hanger is set to be THE Commodore games playing sensation. Available from any good software store for just £3.95.

shoota  
ids, then  
ota you!

In the shops  
from November 23rd

# Shoot the Rapids

AUTHOR - PAUL BLUM

Ever wondered what it would be like to face the force of water in a top class canoe, alone, run? Well wonder no more because you can enjoy the fast action thrill of competitive canoeing from the comfort of your own armchair with *Shoot the Rapids*.

It's a game that involves real skill because you must move your joystick to simulate paddling action. You must get through the gates of the slalom course in the fastest time possible, while avoiding the river bank and rocks. There are also extra hazards like rogue speed boats and misbehaving beavers to worry about.

This multi level game features increasingly difficult river courses with superb graphics and smooth scrolling along the river. Qualifying times have to be reached to move onto the next course.

With Hall of Fame, one or two player scoring and joystick competitiveness, *Shoot the Rapids* is probably the best sports action simulation game devised to date. Available from any good software store for just £3.95.

**NEW**  
Sensational  
Software

©1989 Sensational Software  
All rights reserved.  
The name of the author

£3.95

New Gamescom products are sold according to  
the terms of order and conditions of sale.

EVERYONE knows the pattern — there are early respondents by their wooden legs, doctored pictures added to their shoulders, and their language: "Aaaaah, I'm lost." "Oh, you must **SOFT-SOFT** pirate!" Well they speak a different language, don't they?

There has recently been a lot of talk and some action about software piracy. The talk has been about cracks and copy commercially marketed software. The action has involved a few court cases by established software houses.

I'm not going to set myself up as judge, let us agree on copying, but I will express my opinion in general.

To copy software that has already been marketed, and re-market it in any form, would seem a clear case of theft. The law ought to deal with this case as it does with literary copy rights. In fact there are some existing laws that try to cover this area.

To buy a piece of software and copy it for a friend or to put it from tape to disk is not so clearly a case of piracy.

The large game companies claim that they are losing millions every year from such copying. Of course if software companies start taking individuals to court, when they are only making a copy for 'their' down the road, it prevents them with at least a large PR problem. How do they justify prosecution their customers?

The only other avenue open to them is to protect their software. What's that? Did I hear several large software companies screaming, "but we do"! In six years I have seen just two pieces of software which have been seriously protected, and at the last count I owned 700 items, all unguarded!

Of course people want to put their favourite games on cassettes or disk, and good protection could allow that.



business along with their copying services.

While this might be a good idea and is good-faith, one may well get a better deal in the long term by having each program individually protected to ensure that it will take someone a good deal of time to break into a copy it.

A new hero for readers and software houses — apart from the copiers already

surely of wars could cope in. Any good programmer would not allow you the luxury of access to his information. It is very easy to have the main code and end address placed into the tape buffer with any program as the header virtually unobtainable.

Some programs have such weak protection on them that the header may be got at by a load from a machine language monitor, which makes copying very easy and is common on the part of the software houses. There are a few points that should be noted for use on any program. The first should have an auto-run with continuing start and end addresses.

Second, every program can be scrambled, the map key should be disabled where possible, and programs should be hidden with checks in the code for a proper load.

Included here are a few limited programs to help you put the elements of protection and to encourage software houses to produce protection that will be unobtainable!

The first program is an auto-run — it is set up to save a final program without auto-run on it. It is by no means foolproof and could be enhanced in many ways, but it does give the general idea. There is a disassembly of the code for you to study and a flow loader to make things easy. The basic loader should be stored and saved. On loading it checks whether code is correct or not. If all is well the program will give you the format for saving a program. The *Disassemble* is optional.

In general, the program stores the start and end addresses of the program to be saved. Next, a piece of code is transferred to BASIC, has comments and the basic pointers changed to enable it to be saved. The basic pointers for the program in BASIC

# Software Protection

If we just talk about the 65, there are now copiers that allow you to copy from tape to disk, disk to tape, tape to tape and disk to disk. There is also a variety which will allow you to Turbo load your programs, not that turbo loaders offer any protection at all, they simply speed up loading times!

Of course the companies that are producing the copiers are getting a lot of flak from other software companies, and magazines are in cases being asked rather strongly not to carry adverts for such products.

The most sensible course of action for anyone wishing to prevent piracy, concerning your programs, is to prevent it by protecting the programs properly.

This is not simple, but it is possible. The first place to start is by always knowing what the competition is offering to the public in terms of copiers. This will enable a good programmer to ensure that the latest range of copiers will be useless against your programs. (Many copying companies are currently willing permission to software

manufactured, there is the fastidious audio copy. On some, movies this is fairly easy, but the 65 is fairly fussy about the breaks used, and what audio copying remains a possibility is difficult.

There is a way of protecting against such copying, but the general opinion is that the expense involved in doing this is too great.

The first thing anyone wishing to copy a program from tape will do is to try to load the first part and glean as much information as possible. For different reasons this is usually difficult. If a program will not load and be compared then the following command will give you the header information.

OPEN:format>

In direct mode this will find the first header and stop the tape. At this point the name of the program and the start and end addresses are to be found in the tape buffer.

There may also be a program loaded in the header. At this point you do have a lot of information about the program and in a

are then entered, and another way is executed. When the program is loaded a wild auto-run, disabling the stop key, loading and running the next program on tape.

As mentioned before, this is not an undetectable auto-run, but a work! An addition to this might be to scramble the program to be saved and to unscramble it before executing, the more code needed would look like the

```
LDA #100
STA #100
LDA #101
STA #101
LDA #102
STA #102
LDA #103
STA #103
LDA #104
STA #104
LDA #105
STA #105
LDA #106
STA #106
LDA #107
STA #107
LDA #108
STA #108
LDA #109
STA #109
LDA #110
STA #110
LDA #111
STA #111
LDA #112
STA #112
LDA #113
STA #113
LDA #114
STA #114
LDA #115
STA #115
LDA #116
STA #116
LDA #117
STA #117
LDA #118
STA #118
LDA #119
STA #119
LDA #120
STA #120
LDA #121
STA #121
LDA #122
STA #122
LDA #123
STA #123
LDA #124
STA #124
LDA #125
STA #125
LDA #126
STA #126
LDA #127
STA #127
LDA #128
STA #128
LDA #129
STA #129
LDA #130
STA #130
LDA #131
STA #131
LDA #132
STA #132
LDA #133
STA #133
LDA #134
STA #134
LDA #135
STA #135
LDA #136
STA #136
LDA #137
STA #137
LDA #138
STA #138
LDA #139
STA #139
LDA #140
STA #140
LDA #141
STA #141
LDA #142
STA #142
LDA #143
STA #143
LDA #144
STA #144
LDA #145
STA #145
LDA #146
STA #146
LDA #147
STA #147
LDA #148
STA #148
LDA #149
STA #149
LDA #150
STA #150
LDA #151
STA #151
LDA #152
STA #152
LDA #153
STA #153
LDA #154
STA #154
LDA #155
STA #155
LDA #156
STA #156
LDA #157
STA #157
LDA #158
STA #158
LDA #159
STA #159
LDA #160
STA #160
LDA #161
STA #161
LDA #162
STA #162
LDA #163
STA #163
LDA #164
STA #164
LDA #165
STA #165
LDA #166
STA #166
LDA #167
STA #167
LDA #168
STA #168
LDA #169
STA #169
LDA #170
STA #170
LDA #171
STA #171
LDA #172
STA #172
LDA #173
STA #173
LDA #174
STA #174
LDA #175
STA #175
LDA #176
STA #176
LDA #177
STA #177
LDA #178
STA #178
LDA #179
STA #179
LDA #180
STA #180
LDA #181
STA #181
LDA #182
STA #182
LDA #183
STA #183
LDA #184
STA #184
LDA #185
STA #185
LDA #186
STA #186
LDA #187
STA #187
LDA #188
STA #188
LDA #189
STA #189
LDA #190
STA #190
LDA #191
STA #191
LDA #192
STA #192
LDA #193
STA #193
LDA #194
STA #194
LDA #195
STA #195
LDA #196
STA #196
LDA #197
STA #197
LDA #198
STA #198
LDA #199
STA #199
LDA #200
STA #200
LDA #201
STA #201
LDA #202
STA #202
LDA #203
STA #203
LDA #204
STA #204
LDA #205
STA #205
LDA #206
STA #206
LDA #207
STA #207
LDA #208
STA #208
LDA #209
STA #209
LDA #210
STA #210
LDA #211
STA #211
LDA #212
STA #212
LDA #213
STA #213
LDA #214
STA #214
LDA #215
STA #215
LDA #216
STA #216
LDA #217
STA #217
LDA #218
STA #218
LDA #219
STA #219
LDA #220
STA #220
LDA #221
STA #221
LDA #222
STA #222
LDA #223
STA #223
LDA #224
STA #224
LDA #225
STA #225
LDA #226
STA #226
LDA #227
STA #227
LDA #228
STA #228
LDA #229
STA #229
LDA #230
STA #230
LDA #231
STA #231
LDA #232
STA #232
LDA #233
STA #233
LDA #234
STA #234
LDA #235
STA #235
LDA #236
STA #236
LDA #237
STA #237
LDA #238
STA #238
LDA #239
STA #239
LDA #240
STA #240
LDA #241
STA #241
LDA #242
STA #242
LDA #243
STA #243
LDA #244
STA #244
LDA #245
STA #245
LDA #246
STA #246
LDA #247
STA #247
LDA #248
STA #248
LDA #249
STA #249
LDA #250
STA #250
LDA #251
STA #251
LDA #252
STA #252
LDA #253
STA #253
LDA #254
STA #254
LDA #255
STA #255
LDA #256
STA #256
LDA #257
STA #257
LDA #258
STA #258
LDA #259
STA #259
LDA #260
STA #260
LDA #261
STA #261
LDA #262
STA #262
LDA #263
STA #263
LDA #264
STA #264
LDA #265
STA #265
LDA #266
STA #266
LDA #267
STA #267
LDA #268
STA #268
LDA #269
STA #269
LDA #270
STA #270
LDA #271
STA #271
LDA #272
STA #272
LDA #273
STA #273
LDA #274
STA #274
LDA #275
STA #275
LDA #276
STA #276
LDA #277
STA #277
LDA #278
STA #278
LDA #279
STA #279
LDA #280
STA #280
LDA #281
STA #281
LDA #282
STA #282
LDA #283
STA #283
LDA #284
STA #284
LDA #285
STA #285
LDA #286
STA #286
LDA #287
STA #287
LDA #288
STA #288
LDA #289
STA #289
LDA #290
STA #290
LDA #291
STA #291
LDA #292
STA #292
LDA #293
STA #293
LDA #294
STA #294
LDA #295
STA #295
LDA #296
STA #296
LDA #297
STA #297
LDA #298
STA #298
LDA #299
STA #299
LDA #300
STA #300
LDA #301
STA #301
LDA #302
STA #302
LDA #303
STA #303
LDA #304
STA #304
LDA #305
STA #305
LDA #306
STA #306
LDA #307
STA #307
LDA #308
STA #308
LDA #309
STA #309
LDA #310
STA #310
LDA #311
STA #311
LDA #312
STA #312
LDA #313
STA #313
LDA #314
STA #314
LDA #315
STA #315
LDA #316
STA #316
LDA #317
STA #317
LDA #318
STA #318
LDA #319
STA #319
LDA #320
STA #320
LDA #321
STA #321
LDA #322
STA #322
LDA #323
STA #323
LDA #324
STA #324
LDA #325
STA #325
LDA #326
STA #326
LDA #327
STA #327
LDA #328
STA #328
LDA #329
STA #329
LDA #330
STA #330
LDA #331
STA #331
LDA #332
STA #332
LDA #333
STA #333
LDA #334
STA #334
LDA #335
STA #335
LDA #336
STA #336
LDA #337
STA #337
LDA #338
STA #338
LDA #339
STA #339
LDA #340
STA #340
LDA #341
STA #341
LDA #342
STA #342
LDA #343
STA #343
LDA #344
STA #344
LDA #345
STA #345
LDA #346
STA #346
LDA #347
STA #347
LDA #348
STA #348
LDA #349
STA #349
LDA #350
STA #350
LDA #351
STA #351
LDA #352
STA #352
LDA #353
STA #353
LDA #354
STA #354
LDA #355
STA #355
LDA #356
STA #356
LDA #357
STA #357
LDA #358
STA #358
LDA #359
STA #359
LDA #360
STA #360
LDA #361
STA #361
LDA #362
STA #362
LDA #363
STA #363
LDA #364
STA #364
LDA #365
STA #365
LDA #366
STA #366
LDA #367
STA #367
LDA #368
STA #368
LDA #369
STA #369
LDA #370
STA #370
LDA #371
STA #371
LDA #372
STA #372
LDA #373
STA #373
LDA #374
STA #374
LDA #375
STA #375
LDA #376
STA #376
LDA #377
STA #377
LDA #378
STA #378
LDA #379
STA #379
LDA #380
STA #380
LDA #381
STA #381
LDA #382
STA #382
LDA #383
STA #383
LDA #384
STA #384
LDA #385
STA #385
LDA #386
STA #386
LDA #387
STA #387
LDA #388
STA #388
LDA #389
STA #389
LDA #390
STA #390
LDA #391
STA #391
LDA #392
STA #392
LDA #393
STA #393
LDA #394
STA #394
LDA #395
STA #395
LDA #396
STA #396
LDA #397
STA #397
LDA #398
STA #398
LDA #399
STA #399
LDA #400
STA #400
LDA #401
STA #401
LDA #402
STA #402
LDA #403
STA #403
LDA #404
STA #404
LDA #405
STA #405
LDA #406
STA #406
LDA #407
STA #407
LDA #408
STA #408
LDA #409
STA #409
LDA #410
STA #410
LDA #411
STA #411
LDA #412
STA #412
LDA #413
STA #413
LDA #414
STA #414
LDA #415
STA #415
LDA #416
STA #416
LDA #417
STA #417
LDA #418
STA #418
LDA #419
STA #419
LDA #420
STA #420
LDA #421
STA #421
LDA #422
STA #422
LDA #423
STA #423
LDA #424
STA #424
LDA #425
STA #425
LDA #426
STA #426
LDA #427
STA #427
LDA #428
STA #428
LDA #429
STA #429
LDA #430
STA #430
LDA #431
STA #431
LDA #432
STA #432
LDA #433
STA #433
LDA #434
STA #434
LDA #435
STA #435
LDA #436
STA #436
LDA #437
STA #437
LDA #438
STA #438
LDA #439
STA #439
LDA #440
STA #440
LDA #441
STA #441
LDA #442
STA #442
LDA #443
STA #443
LDA #444
STA #444
LDA #445
STA #445
LDA #446
STA #446
LDA #447
STA #447
LDA #448
STA #448
LDA #449
STA #449
LDA #450
STA #450
LDA #451
STA #451
LDA #452
STA #452
LDA #453
STA #453
LDA #454
STA #454
LDA #455
STA #455
LDA #456
STA #456
LDA #457
STA #457
LDA #458
STA #458
LDA #459
STA #459
LDA #460
STA #460
LDA #461
STA #461
LDA #462
STA #462
LDA #463
STA #463
LDA #464
STA #464
LDA #465
STA #465
LDA #466
STA #466
LDA #467
STA #467
LDA #468
STA #468
LDA #469
STA #469
LDA #470
STA #470
LDA #471
STA #471
LDA #472
STA #472
LDA #473
STA #473
LDA #474
STA #474
LDA #475
STA #475
LDA #476
STA #476
LDA #477
STA #477
LDA #478
STA #478
LDA #479
STA #479
LDA #480
STA #480
LDA #481
STA #481
LDA #482
STA #482
LDA #483
STA #483
LDA #484
STA #484
LDA #485
STA #485
LDA #486
STA #486
LDA #487
STA #487
LDA #488
STA #488
LDA #489
STA #489
LDA #490
STA #490
LDA #491
STA #491
LDA #492
STA #492
LDA #493
STA #493
LDA #494
STA #494
LDA #495
STA #495
LDA #496
STA #496
LDA #497
STA #497
LDA #498
STA #498
LDA #499
STA #499
LDA #500
STA #500
LDA #501
STA #501
LDA #502
STA #502
LDA #503
STA #503
LDA #504
STA #504
LDA #505
STA #505
LDA #506
STA #506
LDA #507
STA #507
LDA #508
STA #508
LDA #509
STA #509
LDA #510
STA #510
LDA #511
STA #511
LDA #512
STA #512
LDA #513
STA #513
LDA #514
STA #514
LDA #515
STA #515
LDA #516
STA #516
LDA #517
STA #517
LDA #518
STA #518
LDA #519
STA #519
LDA #520
STA #520
LDA #521
STA #521
LDA #522
STA #522
LDA #523
STA #523
LDA #524
STA #524
LDA #525
STA #525
LDA #526
STA #526
LDA #527
STA #527
LDA #528
STA #528
LDA #529
STA #529
LDA #530
STA #530
LDA #531
STA #531
LDA #532
STA #532
LDA #533
STA #533
LDA #534
STA #534
LDA #535
STA #535
LDA #536
STA #536
LDA #537
STA #537
LDA #538
STA #538
LDA #539
STA #539
LDA #540
STA #540
LDA #541
STA #541
LDA #542
STA #542
LDA #543
STA #543
LDA #544
STA #544
LDA #545
STA #545
LDA #546
STA #546
LDA #547
STA #547
LDA #548
STA #548
LDA #549
STA #549
LDA #550
STA #550
LDA #551
STA #551
LDA #552
STA #552
LDA #553
STA #553
LDA #554
STA #554
LDA #555
STA #555
LDA #556
STA #556
LDA #557
STA #557
LDA #558
STA #558
LDA #559
STA #559
LDA #560
STA #560
LDA #561
STA #561
LDA #562
STA #562
LDA #563
STA #563
LDA #564
STA #564
LDA #565
STA #565
LDA #566
STA #566
LDA #567
STA #567
LDA #568
STA #568
LDA #569
STA #569
LDA #570
STA #570
LDA #571
STA #571
LDA #572
STA #572
LDA #573
STA #573
LDA #574
STA #574
LDA #575
STA #575
LDA #576
STA #576
LDA #577
STA #577
LDA #578
STA #578
LDA #579
STA #579
LDA #580
STA #580
LDA #581
STA #581
LDA #582
STA #582
LDA #583
STA #583
LDA #584
STA #584
LDA #585
STA #585
LDA #586
STA #586
LDA #587
STA #587
LDA #588
STA #588
LDA #589
STA #589
LDA #590
STA #590
LDA #591
STA #591
LDA #592
STA #592
LDA #593
STA #593
LDA #594
STA #594
LDA #595
STA #595
LDA #596
STA #596
LDA #597
STA #597
LDA #598
STA #598
LDA #599
STA #599
LDA #600
STA #600
LDA #601
STA #601
LDA #602
STA #602
LDA #603
STA #603
LDA #604
STA #604
LDA #605
STA #605
LDA #606
STA #606
LDA #607
STA #607
LDA #608
STA #608
LDA #609
STA #609
LDA #610
STA #610
LDA #611
STA #611
LDA #612
STA #612
LDA #613
STA #613
LDA #614
STA #614
LDA #615
STA #615
LDA #616
STA #616
LDA #617
STA #617
LDA #618
STA #618
LDA #619
STA #619
LDA #620
STA #620
LDA #621
STA #621
LDA #622
STA #622
LDA #623
STA #623
LDA #624
STA #624
LDA #625
STA #625
LDA #626
STA #626
LDA #627
STA #627
LDA #628
STA #628
LDA #629
STA #629
LDA #630
STA #630
LDA #631
STA #631
LDA #632
STA #632
LDA #633
STA #633
LDA #634
STA #634
LDA #635
STA #635
LDA #636
STA #636
LDA #637
STA #637
LDA #638
STA #638
LDA #639
STA #639
LDA #640
STA #640
LDA #641
STA #641
LDA #642
STA #642
LDA #643
STA #643
LDA #644
STA #644
LDA #645
STA #645
LDA #646
STA #646
LDA #647
STA #647
LDA #648
STA #648
LDA #649
STA #649
LDA #650
STA #650
LDA #651
STA #651
LDA #652
STA #652
LDA #653
STA #653
LDA #654
STA #654
LDA #655
STA #655
LDA #656
STA #656
LDA #657
STA #657
LDA #658
STA #658
LDA #659
STA #659
LDA #660
STA #660
LDA #661
STA #661
LDA #662
STA #662
LDA #663
STA #663
LDA #664
STA #664
LDA #665
STA #665
LDA #666
STA #666
LDA #667
STA #667
LDA #668
STA #668
LDA #669
STA #669
LDA #670
STA #670
LDA #671
STA #671
LDA #672
STA #672
LDA #673
STA #673
LDA #674
STA #674
LDA #675
STA #675
LDA #676
STA #676
LDA #677
STA #677
LDA #678
STA #678
LDA #679
STA #679
LDA #680
STA #680
LDA #681
STA #681
LDA #682
STA #682
LDA #683
STA #683
LDA #684
STA #684
LDA #685
STA #685
LDA #686
STA #686
LDA #687
STA #687
LDA #688
STA #688
LDA #689
STA #689
LDA #690
STA #690
LDA #691
STA #691
LDA #692
STA #692
LDA #693
STA #693
LDA #694
STA #694
LDA #695
STA #695
LDA #696
STA #696
LDA #697
STA #697
LDA #698
STA #698
LDA #699
STA #699
LDA #700
STA #700
LDA #701
STA #701
LDA #702
STA #702
LDA #703
STA #703
LDA #704
STA #704
LDA #705
STA #705
LDA #706
STA #706
LDA #707
STA #707
LDA #708
STA #708
LDA #709
STA #709
LDA #710
STA #710
LDA #711
STA #711
LDA #712
STA #712
LDA #713
STA #713
LDA #714
STA #714
LDA #715
STA #715
LDA #716
STA #716
LDA #717
STA #717
LDA #718
STA #718
LDA #719
STA #719
LDA #720
STA #720
LDA #721
STA #721
LDA #722
STA #722
LDA #723
STA #723
LDA #724
STA #724
LDA #725
STA #725
LDA #726
STA #726
LDA #727
STA #727
LDA #728
STA #728
LDA #729
STA #729
LDA #730
STA #730
LDA #731
STA #731
LDA #732
STA #732
LDA #733
STA #733
LDA #734
STA #734
LDA #735
STA #735
LDA #736
STA #736
LDA #737
STA #737
LDA #738
STA #738
LDA #739
STA #739
LDA #740
STA #740
LDA #741
STA #741
LDA #742
STA #742
LDA #743
STA #743
LDA #744
STA #744
LDA #745
STA #745
LDA #746
STA #746
LDA #747
STA #747
LDA #748
STA #748
LDA #749
STA #749
LDA #750
STA #750
LDA #751
STA #751
LDA #752
STA #752
LDA #753
STA #753
LDA #754
STA #754
LDA #755
STA #755
LDA #756
STA #756
LDA #757
STA #757
LDA #758
STA #758
LDA #759
STA #759
LDA #760
STA #760
LDA #761
STA #761
LDA #762
STA #762
LDA #763
STA #763
LDA #764
STA #764
LDA #765
STA #765
LDA #766
STA #766
LDA #767
STA #767
LDA #768
STA #768
LDA #769
STA #769
LDA #770
STA #770
LDA #771
STA #771
LDA #772
STA #772
LDA #773
STA #773
LDA #774
STA #774
LDA #775
STA #775
LDA #776
STA #776
LDA #777
STA #777
LDA #778
STA #778
LDA #779
STA #779
LDA #780
STA #780
LDA #781
STA #781
LDA #782
STA #782
LDA #783
STA #783
LDA #784
STA #784
LDA #785
STA #785
LDA #786
STA #786
LDA #787
STA #787
LDA #788
STA #788
LDA #789
STA #789
LDA #790
STA #790
LDA #791
STA #791
LDA #792
STA #792
LDA #793
STA #793
LDA #794
STA #794
LDA #795
STA #795
LDA #796
STA #796
LDA #797
STA #797
LDA #798
STA #798
LDA #799
STA #799
LDA #800
STA #800
LDA #801
STA #801
LDA #802
STA #802
LDA #803
STA #803
LDA #804
STA #804
LDA #805
STA #805
LDA #806
STA #806
LDA #807
STA #807
LDA #808
STA #808
LDA #809
STA #809
LDA #810
STA #810
LDA #811
STA #811
LDA #812
STA #812
LDA #813
STA #813
LDA #814
STA #814
LDA #815
STA #815
LDA #816
STA #816
LDA #817
STA #817
LDA #818
STA #818
LDA #819
STA #819
LDA #820
STA #820
LDA #821
STA #821
LDA #822
STA #822
LDA #823
STA #823
LDA #824
STA #824
LDA #825
STA #825
LDA #826
STA #826
LDA #827
STA #827
LDA #828
STA #828
LDA #829
STA #829
LDA #830
STA #830
LDA #831
STA #831
LDA #832
STA #832
LDA #833
STA #833
LDA #834
STA #834
LDA #835
STA #835
LDA #836
STA #836
LDA #837
STA #837
LDA #838
STA #838
LDA #839
STA #839
LDA #840
STA #840
LDA #841
STA #841
LDA #842
STA #842
LDA #843
STA #843
LDA #844
STA #844
LDA #845
STA #845
LDA #846
STA #846
LDA #847
STA #847
LDA #848
STA #848
LDA #849
STA #849
LDA #850
STA #850
LDA #851
STA #851
LDA #852
STA #852
LDA #853
STA #853
LDA #854
STA #854
LDA #855
STA #855
LDA #856
STA #856
LDA #857
STA #857
LDA #858
STA #858
LDA #859
STA #859
LDA #860
STA #860
LDA #861
STA #861
LDA #862
STA #862
LDA #863
STA #863
LDA #864
STA #864
LDA #865
STA #865
LDA #866
STA #866
LDA #867
STA #867
LDA #868
STA #868
LDA #869
STA #869
LDA #870
STA #870
LDA #871
STA #871
LDA #872
STA #
```



The routine would read and assemble the whole of normal RAM on the first pass (normal) and unassemble the same area on the second pass (display). The main program could be hidden. If it is a basic program then the start of RAM could be changed, using location 41 & 44, the vector could be moved.

Any cartridge that is plugged in to the 84 has its own code. Most of that is readable code and therefore can be copied. The complete cartridge can be copied on to a device of your choice, but this is not an example.

However, portions of code or all of the code in a cartridge can be transferred to another part of memory and then saved. Of course all jumps and branches will need to be reset — this can be a huge job and will require some skill.

As mentioned earlier, programs can be broken and reassembled to find answers trying to make sense of them. There are a number of ways of doing this and a number of steps that should be taken. The following routine could be used before using the program with an auto-run, then adding several layers of protection.

There is more than one way of hiding programs from prying eyes. If we look at basic programs the most obvious and easiest is to disable the LIST command; this can be done by altering the contents of the vector labelled \$FPLIST = \$0006 and \$0007 hex. It can be simply disabled with the following:

POKE 715,\$00;print return;

This will disable the list command, but there are other possibilities. To return to normal enter:

POKE 715,\$00;print return;

Now enter the following in direct mode: POKE 716,\$18;POKE 715,\$10;print return;

If you are foolish enough to try the list command now the 84 will cry:

Any of the vectors, OPEN, CLOSE, SAVE, LOAD etc can be treated in the same way. If they are not needed they can be disabled or pointed to another system. The best thing to do is to point them at a routine of your own. The code below deals with the run - stop and restart keys:

```

$000A LDA # $04 (new low byte)
$000B STA $0028 (start in new vector)
$000C LDA # $00 (new high byte)
$000D STA $0029
$000E LDA # $01 (stop vector points here now)
$000F RTS

```

The result of calling the above routine is to disable the run - stop and restart keys, by pointing it to a routine at \$000A hex that simply disables the keys every time they are pressed. The above technique can be used on all vectors, even the interrupts, although that has little code efficiency.

However, back to hiding programs. The next technique is to fiddle with the basic

```

1 REM THIS IS HIGHLIGHTED
2 PRINT"FIRST LINE"
3 PRINT"SECOND LINE"
4 PRINT"THIRD LINE"
5 PRINT"FOURTH LINE"

```

Basic

line number pointers. This can only be easily done from a machine language monitor. The idea is to take the first pointer and change it to point at the last line in the Basic program. To illustrate this I have included a (the first Basic program in a demo.

First enter and view the small Basic program, then enter your monitor. If you don't have a monitor, it should be easy enough to get hold of a copy of Joe Butterfield's Supercom 64 from ICPLAG. From the following command:

M \$400-\$400

This should give you the display below.

The first pointer is at locations \$0001 - \$0002 hex. They should be changed so that the first line looks like this:

\$0000 00 00 00 00 00 00 00

Having made the changes, exit the monitor and hit the program. You should only see one line, which will be the first line. This technique can be used on any program, no matter where Basic RAM starts. Simply change the first pointer to look at the end of the Basic program. The end of a Basic program is located by using a monitor to search through until the J vector has found.

```

10 PRINT"FIRST LINE",PRINT"2ND LINE"
20 PRINT"3RD LINE"
30 PRINT"4TH LINE"
40 PRINT"5TH LINE"
50 PRINT"6TH LINE"
60 PRINT"7TH LINE"
70 PRINT"8TH LINE"
80 PRINT"9TH LINE"
90 PRINT"10TH LINE"
100 PRINT"11TH LINE"
110 PRINT"12TH LINE"
120 PRINT"13TH LINE"
130 PRINT"14TH LINE"
140 PRINT"15TH LINE"
150 PRINT"16TH LINE"
160 PRINT"17TH LINE"
170 PRINT"18TH LINE"
180 PRINT"19TH LINE"
190 PRINT"20TH LINE"
200 PRINT"21TH LINE"
210 PRINT"22TH LINE"
220 PRINT"23TH LINE"
230 PRINT"24TH LINE"
240 PRINT"25TH LINE"
250 PRINT"26TH LINE"
260 PRINT"27TH LINE"
270 PRINT"28TH LINE"
280 PRINT"29TH LINE"
290 PRINT"30TH LINE"
300 PRINT"31TH LINE"
310 PRINT"32TH LINE"
320 PRINT"33TH LINE"
330 PRINT"34TH LINE"
340 PRINT"35TH LINE"
350 PRINT"36TH LINE"
360 PRINT"37TH LINE"
370 PRINT"38TH LINE"
380 PRINT"39TH LINE"
390 PRINT"40TH LINE"
400 PRINT"41TH LINE"
410 PRINT"42TH LINE"
420 PRINT"43TH LINE"
430 PRINT"44TH LINE"
440 PRINT"45TH LINE"
450 PRINT"46TH LINE"
460 PRINT"47TH LINE"
470 PRINT"48TH LINE"
480 PRINT"49TH LINE"
490 PRINT"50TH LINE"
500 PRINT"51TH LINE"
510 PRINT"52TH LINE"
520 PRINT"53TH LINE"
530 PRINT"54TH LINE"
540 PRINT"55TH LINE"
550 PRINT"56TH LINE"
560 PRINT"57TH LINE"
570 PRINT"58TH LINE"
580 PRINT"59TH LINE"
590 PRINT"60TH LINE"
600 PRINT"61TH LINE"
610 PRINT"62TH LINE"
620 PRINT"63TH LINE"
630 PRINT"64TH LINE"
640 PRINT"65TH LINE"
650 PRINT"66TH LINE"
660 PRINT"67TH LINE"
670 PRINT"68TH LINE"
680 PRINT"69TH LINE"
690 PRINT"70TH LINE"
700 PRINT"71TH LINE"
710 PRINT"72TH LINE"
720 PRINT"73TH LINE"
730 PRINT"74TH LINE"
740 PRINT"75TH LINE"
750 PRINT"76TH LINE"
760 PRINT"77TH LINE"
770 PRINT"78TH LINE"
780 PRINT"79TH LINE"
790 PRINT"80TH LINE"
800 PRINT"81TH LINE"
810 PRINT"82TH LINE"
820 PRINT"83TH LINE"
830 PRINT"84TH LINE"
840 PRINT"85TH LINE"
850 PRINT"86TH LINE"
860 PRINT"87TH LINE"
870 PRINT"88TH LINE"
880 PRINT"89TH LINE"
890 PRINT"90TH LINE"
900 PRINT"91TH LINE"
910 PRINT"92TH LINE"
920 PRINT"93TH LINE"
930 PRINT"94TH LINE"
940 PRINT"95TH LINE"
950 PRINT"96TH LINE"
960 PRINT"97TH LINE"
970 PRINT"98TH LINE"
980 PRINT"99TH LINE"
990 PRINT"100TH LINE"

```

Basic loader

This advances the end of the program. Using Supercom the following command should work:

M \$000-\$000 00 00 00

Before we move on, it may be interesting to note that we can have control and colour codes work directly in our programs as well as with the BASIC compiler? Again this can only be done by using a monitor.

For example, using our Basic demo program we can remove the REM at line one and highlight the line. To do this enter your monitor with the Basic program at

PC	RR	AC	IR	VR	SP	
0000	30	00	00	00	00	P4
0001	00	10	00	01	00	0F 20 04
0002	40	49	53	20	47	53 20 40
0003	47	47	48	4C	47	47 40 54
0004	43	44	00	20	00	04 00 7F
0005	22	44	47	52	53	54 20 4C
0006	47	4C	43	22	00	40 00 14
0007	00	7F	22	53	43	43 4F 4E
0008	44	20	4C	49	4E	45 32 00
0009	52	00	1C	00	7F	32 54 40
000A	47	52	44	20	4C	49 4E 40
000B	22	00	43	00	30	00 9F 32
000C	4E	4F	53	53	54	40 20 4C
000D	49	4E	43	22	00	00 00 00

Basic mode

memory, and change the SP to location \$0000 hex to 12 hex. The first line should then look like this:

\$0000 00 00 01 00 12 00 04

Now exit the monitor and hit the program. If you got it right, line 1 is highlighted. This is not possible from Basic, as the code for reverse on SCL has not yet been entered. Trying to do this from Basic will give the reverse symbol, or simply 'R', at the top.

Some of you may have already realised that it is possible to enter other codes in the same way. Here is one more for a start, enter the monitor and look at the program with:

M \$000-\$000

Now change location \$0000 to 1C, which will give you the following:

\$0000 00 00 01 00 1C 00 04

Exit the monitor and hit the program. The

PC	RR	AC	IR	VR	SP	
0000	30	00	00	00	00	P4
0001	00	00	00	00	00	70 20 30
0002	34	31	00	00	00	00 00 00
0003	47	00	00	00	00	00 00 00
0004	70	00	00	00	00	00 00 00
0005	00	00	00	00	00	00 00 00
0006	47	00	00	00	00	00 00 00
0007	00	00	00	00	00	00 00 00
0008	00	00	00	00	00	00 00 00
0009	00	00	00	00	00	00 00 00
000A	00	00	00	00	00	00 00 00
000B	00	00	00	00	00	00 00 00
000C	00	00	00	00	00	00 00 00
000D	00	00	00	00	00	00 00 00
000E	00	00	00	00	00	00 00 00
000F	00	00	00	00	00	00 00 00
0010	00	00	00	00	00	00 00 00
0011	00	00	00	00	00	00 00 00
0012	00	00	00	00	00	00 00 00
0013	00	00	00	00	00	00 00 00
0014	00	00	00	00	00	00 00 00
0015	00	00	00	00	00	00 00 00
0016	00	00	00	00	00	00 00 00
0017	00	00	00	00	00	00 00 00
0018	00	00	00	00	00	00 00 00
0019	00	00	00	00	00	00 00 00
001A	00	00	00	00	00	00 00 00
001B	00	00	00	00	00	00 00 00
001C	00	00	00	00	00	00 00 00
001D	00	00	00	00	00	00 00 00
001E	00	00	00	00	00	00 00 00
001F	00	00	00	00	00	00 00 00

\$00 Basic

word flagger — a red flag. Have fun with the rest, try any code that you fancy!

Finally, a machine code version that points to a Basic program elsewhere in memory, so that when it is loaded and loaded, only an 8191 number is visible.

There is a disassemblable being and a memory dump included — the disassemblable being looks a little odd, but all will be revealed. The reason may be to make this a by using the memory dump. To do this enter the following from your monitor:

M 0000 0000

Then will display the memory locations. Now enter the 515 dump from the previous page.

Having done this, turn it off and then run the monitor and list the program. If all is well you should be presented with the following:

01550000

A little explanation is needed here. Locations 0000 and 0000 hex are at the end of the program which is 0000 hex. Locations 0000 and 0000 are the first Basic hex number (1000 in this case). The 000 hex is location 0000 in the 515 machine and location 0000 to 1000

refers to the Basic code for the call (0001).

When a RUN is performed a jump to location 0001 decimal, 0000 hex. If you look at this address in the disassembler you can see what happens.

The first instruction at 0000 hex branches to 0001 hex where it should find the Subroutine program.

Do not forget to enter and save this program, we will come back to it later. The next two instructions clear the screen, a RUN is placed on the keyboard and the first line is and the start of Basic is moved to start at 0000 hex. The subprogram from 0001 to 0000 moves the screen to 0000 decimal and the screen is cleared again. Finally our new Basic area has the first instruction set in and the program finishes.

At this point the RUN on the keyboard will be executed on the Basic program which should be at this location. The way to save or load a Basic program onto the new disk machine is set by a with the following from direct mode:

POKE 43,100: POKE 44,1: POKE 45,0: POKE 46,0

Whenever this routine is triggered once the beginning of a Basic program the whole dump should be saved from the monitor, with:

515dump 0000,1000

When done represent the end of the Basic program, remember the 515 area. It can then be returned as a normal Basic program and executed.

The routine from 0000 to 0000 hex is a two page assembly. Any Basic program that is going to be saved with the above routine should first be loaded into 0155 decimal and put through the subroutine. To do this load the routine in 0000, load the Basic program and enter:

515 0155:press return

Now you will the program. As it is now assembled it is verifiable, and will not

PC	SR	AC	SP	BP
0000	00	00	00	00
0001	00	00	00	00
0002	00	00	00	00
0003	00	00	00	00
0004	00	00	00	00
0005	00	00	00	00
0006	00	00	00	00
0007	00	00	00	00
0008	00	00	00	00
0009	00	00	00	00
000A	00	00	00	00
000B	00	00	00	00
000C	00	00	00	00
000D	00	00	00	00
000E	00	00	00	00
000F	00	00	00	00
0010	00	00	00	00
0011	00	00	00	00
0012	00	00	00	00
0013	00	00	00	00
0014	00	00	00	00
0015	00	00	00	00
0016	00	00	00	00
0017	00	00	00	00
0018	00	00	00	00
0019	00	00	00	00
001A	00	00	00	00
001B	00	00	00	00
001C	00	00	00	00
001D	00	00	00	00
001E	00	00	00	00
001F	00	00	00	00

RUN the routine that assembled it must be loaded into memory and saved again before any attempt is made to RUN the program.

This should give you some good ideas about protecting programs, and may well keep you busy for a while adding your own routine. A final thought for now on protection, how would you stop someone from reading or loading your programs in any way at all, even with the (OPEN) instructions. That should keep you busy, although I am not sure if it is possible.

There is no ultimate protection method, and we have covered enough ground to start with, but have hardly touched on the subject. I hope the above gives the well-meaning hacker some ideas on protection, so I wish them luck and do not support anyone wanting to make a profit on their backs.

Respect, well, I hope, be firm, to learn what is possible with these open programs, and may well come up with ideas to help the process of protection along.

Kevin Bergin

00000000	0000	00000000	0000
00000001	0000	00000001	0000
00000002	0000	00000002	0000
00000003	0000	00000003	0000
00000004	0000	00000004	0000
00000005	0000	00000005	0000
00000006	0000	00000006	0000
00000007	0000	00000007	0000
00000008	0000	00000008	0000
00000009	0000	00000009	0000
0000000A	0000	0000000A	0000
0000000B	0000	0000000B	0000
0000000C	0000	0000000C	0000
0000000D	0000	0000000D	0000
0000000E	0000	0000000E	0000
0000000F	0000	0000000F	0000
00000010	0000	00000010	0000
00000011	0000	00000011	0000
00000012	0000	00000012	0000
00000013	0000	00000013	0000
00000014	0000	00000014	0000
00000015	0000	00000015	0000
00000016	0000	00000016	0000
00000017	0000	00000017	0000
00000018	0000	00000018	0000
00000019	0000	00000019	0000
0000001A	0000	0000001A	0000
0000001B	0000	0000001B	0000
0000001C	0000	0000001C	0000
0000001D	0000	0000001D	0000
0000001E	0000	0000001E	0000
0000001F	0000	0000001F	0000
00000020	0000	00000020	0000
00000021	0000	00000021	0000
00000022	0000	00000022	0000
00000023	0000	00000023	0000
00000024	0000	00000024	0000
00000025	0000	00000025	0000
00000026	0000	00000026	0000
00000027	0000	00000027	0000
00000028	0000	00000028	0000
00000029	0000	00000029	0000
0000002A	0000	0000002A	0000
0000002B	0000	0000002B	0000
0000002C	0000	0000002C	0000
0000002D	0000	0000002D	0000
0000002E	0000	0000002E	0000
0000002F	0000	0000002F	0000
00000030	0000	00000030	0000
00000031	0000	00000031	0000
00000032	0000	00000032	0000
00000033	0000	00000033	0000
00000034	0000	00000034	0000
00000035	0000	00000035	0000
00000036	0000	00000036	0000
00000037	0000	00000037	0000
00000038	0000	00000038	0000
00000039	0000	00000039	0000
0000003A	0000	0000003A	0000
0000003B	0000	0000003B	0000
0000003C	0000	0000003C	0000
0000003D	0000	0000003D	0000
0000003E	0000	0000003E	0000
0000003F	0000	0000003F	0000
00000040	0000	00000040	0000
00000041	0000	00000041	0000
00000042	0000	00000042	0000
00000043	0000	00000043	0000
00000044	0000	00000044	0000
00000045	0000	00000045	0000
00000046	0000	00000046	0000
00000047	0000	00000047	0000
00000048	0000	00000048	0000
00000049	0000	00000049	0000
0000004A	0000	0000004A	0000
0000004B	0000	0000004B	0000
0000004C	0000	0000004C	0000
0000004D	0000	0000004D	0000
0000004E	0000	0000004E	0000
0000004F	0000	0000004F	0000
00000050	0000	00000050	0000
00000051	0000	00000051	0000
00000052	0000	00000052	0000
00000053	0000	00000053	0000
00000054	0000	00000054	0000
00000055	0000	00000055	0000
00000056	0000	00000056	0000
00000057	0000	00000057	0000
00000058	0000	00000058	0000
00000059	0000	00000059	0000
0000005A	0000	0000005A	0000
0000005B	0000	0000005B	0000
0000005C	0000	0000005C	0000
0000005D	0000	0000005D	0000
0000005E	0000	0000005E	0000
0000005F	0000	0000005F	0000
00000060	0000	00000060	0000
00000061	0000	00000061	0000
00000062	0000	00000062	0000
00000063	0000	00000063	0000
00000064	0000	00000064	0000
00000065	0000	00000065	0000
00000066	0000	00000066	0000
00000067	0000	00000067	0000
00000068	0000	00000068	0000
00000069	0000	00000069	0000
0000006A	0000	0000006A	0000
0000006B	0000	0000006B	0000
0000006C	0000	0000006C	0000
0000006D	0000	0000006D	0000
0000006E	0000	0000006E	0000
0000006F	0000	0000006F	0000
00000070	0000	00000070	0000
00000071	0000	00000071	0000
00000072	0000	00000072	0000
00000073	0000	00000073	0000
00000074	0000	00000074	0000
00000075	0000	00000075	0000
00000076	0000	00000076	0000
00000077	0000	00000077	0000
00000078	0000	00000078	0000
00000079	0000	00000079	0000
0000007A	0000	0000007A	0000
0000007B	0000	0000007B	0000
0000007C	0000	0000007C	0000
0000007D	0000	0000007D	0000
0000007E	0000	0000007E	0000
0000007F	0000	0000007F	0000
00000080	0000	00000080	0000
00000081	0000	00000081	0000
00000082	0000	00000082	0000
00000083	0000	00000083	0000
00000084	0000	00000084	0000
00000085	0000	00000085	0000
00000086	0000	00000086	0000
00000087	0000	00000087	0000
00000088	0000	00000088	0000
00000089	0000	00000089	0000
0000008A	0000	0000008A	0000
0000008B	0000	0000008B	0000
0000008C	0000	0000008C	0000
0000008D	0000	0000008D	0000
0000008E	0000	0000008E	0000
0000008F	0000	0000008F	0000
00000090	0000	00000090	0000
00000091	0000	00000091	0000
00000092	0000	00000092	0000
00000093	0000	00000093	0000
00000094	0000	00000094	0000
00000095	0000	00000095	0000
00000096	0000	00000096	0000
00000097	0000	00000097	0000
00000098	0000	00000098	0000
00000099	0000	00000099	0000
0000009A	0000	0000009A	0000
0000009B	0000	0000009B	0000
0000009C	0000	0000009C	0000
0000009D	0000	0000009D	0000
0000009E	0000	0000009E	0000
0000009F	0000	0000009F	0000
000000A0	0000	000000A0	0000
000000A1	0000	000000A1	0000
000000A2	0000	000000A2	0000
000000A3	0000	000000A3	0000
000000A4	0000	000000A4	0000
000000A5	0000	000000A5	0000
000000A6	0000	000000A6	0000
000000A7	0000	000000A7	0000
000000A8	0000	000000A8	0000
000000A9	0000	000000A9	0000
000000AA	0000	000000AA	0000
000000AB	0000	000000AB	0000
000000AC	0000	000000AC	0000
000000AD	0000	000000AD	0000
000000AE	0000	000000AE	0000
000000AF	0000	000000AF	0000
000000B0	0000	000000B0	0000
000000B1	0000	000000B1	0000
000000B2	0000	000000B2	0000
000000B3	0000	000000B3	0000
000000B4	0000	000000B4	0000
000000B5	0000	000000B5	0000
000000B6	0000	000000B6	0000
000000B7	0000	000000B7	0000
000000B8	0000	000000B8	0000
000000B9	0000	000000B9	0000
000000BA	0000	000000BA	0000
000000BB	0000	000000BB	0000
000000BC	0000	000000BC	0000
000000BD	0000	000000BD	0000
000000BE	0000	000000BE	0000
000000BF	0000	000000BF	0000
000000C0	0000	000000C0	0000
000000C1	0000	000000C1	0000
000000C2	0000	000000C2	0000
000000C3	0000	000000C3	0000
000000C4	0000	000000C4	0000
000000C5	0000	000000C5	0000
000000C6	0000	000000C6	0000
000000C7	0000	000000C7	0000
000000C8	0000	000000C8	0000
000000C9	0000	000000C9	0000
000000CA	0000	000000CA	0000
000000CB	0000	000000CB	0000
000000CC	0000	000000CC	0000
000000CD	0000	000000CD	0000
000000CE	0000	000000CE	0000
000000CF	0000	000000CF	0000
000000D0	0000	000000D0	0000
000000D1	0000	000000D1	0000
000000D2	0000	000000D2	0000
000000D3	0000	000000D3	0000
000000D4	0000	000000D4	0000
000000D5	0000	000000D5	0000
000000D6	0000	000000D6	0000
000000D7	0000	000000D7	0000
000000D8	0000	000000D8	0000
000000D9	0000	000000D9	0000
000000DA	0000	000000DA	0000
000000DB	0000	000000DB	0000
000000DC	0000	000000DC	0000
000000DD	0000	000000DD	0000
000000DE	0000	000000DE	0000
000000DF	0000	000000DF	0000
000000E0	0000	000000E0	0000
000000E1	0000	000000E1	0000
000000E2	0000	000000E2	0000
000000E3	0000	000000E3	0000
000000E4	0000	000000E4	0000
000000E5	0000	000000E5	0000
000000E6	0000	000000E6	0000
000000E7	0000	000000E7	0000
000000E8	0000	000000E8	0000
000000E9	0000	000000E9	0000
000000EA	0000	000000EA	0000
000000EB	0000	000000EB	0000
000000EC	0000	000000EC	0000
000000ED	0000	000000ED	0000
000000EE	0000	000000EE	0000
000000EF	0000	000000EF	0000
000000F0	0000	000000F0	0000
000000F1	0000	000000F1	0000
000000F2	0000	000000F2	0000
000000F3	0000	000000F3	0000
000000F4	0000	000000F4	0000
000000F5	0000	000000F5	0000
000000F6	0000	000000F6	0000
000000F7	0000	000000F7	0000
000000F8	0000	000000F8	0000
000000F9	0000	000000F9	0000
000000FA	0000	000000FA	0000
000000FB	0000	000000FB	0000
000000FC	0000	000000FC	0000
000000FD	0000	000000FD	0000
000000FE	0000	000000FE	0000
000000FF	0000	000000FF	0000



CB01	03	2E	STA	#2E	CB94	A9	81	LDA	#881		
CB03	A9	ED	LDA	#8ED	CB96	AA		TAX			
CB05	0D	32	STA	#8332	CB97	A8		TAY			
CB06	A9	F5	LDA	#8F5	CB98	28	8A	FF	JBR	#FF8A	
CB0A	0D	33	STA	#8333	CB99	A9	88	LDA	#888		
CB0D	A9	83	LDA	#883	CB9D	A2	88	LDA	#888		
CB0F	0D	82	STA	#8382	CB9F	A8	88	LDA	#888		
CB42	A9	A4	LDA	#8A4	CB41	28	8D	FF	JBR	#FF8D	
CB44	0D	83	STA	#8383	CB44	A9	F8	LDA	#8F8		
CB47	A9	88	LDA	#888	CB46	0D	28	83	STA	#8328	
CB49	0D	9D	STA	#9D	CB49	A9	F4	LDA	#8F4		
CB4B	A9	81	LDA	#881	CB4B	0D	29	83	STA	#8329	
CB4D	A3	81	LDA	#881	CB4E	A9	8D	LDA	#88D		
CB4F	A8	81	LDA	#881	CB48	0D	28	88	STA	#8828	
CB71	28	8A	FF	JBR	#FF8A	CB83	A9	88	LDA	#888	
CB74	A9	88	LDA	#888	CB85	28	0D	FF	JBR	#FF0D	
CB76	28	8D	FF	JBR	#FF8D	CB88	84	2D	STX	#2D	
CB79	A4	2D	LDA	#2D	CB8A	84	2F	STX	#2F		
CB7B	A4	2E	LDA	#2E	CB8C	84	31	STX	#31		
CB7D	A9	28	LDA	#828	CB8E	84	2E	STY	#2E		
CB7F	28	08	FF	JBR	#FF08	CB88	84	38	STY	#38	
CB82	A8		RTB		CB82	84	32	STY	#32		
CB83	A9	83	LDA	#883	CB84	A9	F4	LDA	#8F4		
CB85	0D	82	STA	#8382	CB86	0D	29	83	STA	#8329	
CB88	A9	A4	LDA	#8A4	CB89	A9	8D	LDA	#88D		
CB8A	0D	83	STA	#8383	CB8B	0D	28	83	STA	#8328	
CB8D	A9	88	LDA	#888	CB8E	A9	88	LDA	#888		
CB8F	0D	9D	STA	#9D	CB88	28	8E	A4	JBR	#888E	
CB91	28	8D	FF	JBR	#FF8D	CB83	28	8E	A4	JBR	#888E
					CB84	4C	AE	A7	JMP	#A7AE	

Continued

# Hard Facts on 64 Floppy Disks

The Commodore 64 Disk Comparison is your authoritative guide to all the potential of the 1541 disk drive.

If you have, or are about to buy, a Commodore 1541, then make sure you've this book. The Commodore 64 Disk Comparison.

It's the comprehensive, understandable guide. It introduces you to the hard ware. It explains file and file handling. It explains the internal operations. And it includes programs for storage, recovery, data protection, and file management.

The Commodore 64 Disk Comparison is at your book shop or computer dealer now. Get the facts now.



Please send me the Commodore 64 Disk Comparison at \$17.95 (\$19.95 plus \$2.00 p/h).

- ☐ I would like to purchase the book.
- ☐ I would like to purchase the book.
- ☐ Please charge my Visa/MasterCard for order from \_\_\_\_\_ expires end \_\_\_\_\_

Signed \_\_\_\_\_  
Name \_\_\_\_\_  
Address \_\_\_\_\_

Send to: Sunshine Books  
2000 Little Newport Street, London WC2R 1LG



Look out for the Sunshine range in WH Smiths, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-497 4143.

# THE 64 SOFTWARE CENTRE

1 Princeton Street  
London WC1R 4AL — Tel: 01-430 0954

## Business software

d = disk c = cassette r = cartridge

All prices include VAT

### Accounting systems (Office use)

Adamsoft Systems — Sales Ledger	d	£75.00
Adamsoft Systems — Purchase — General Ledger	d	£75.00
Gensoft — Cashbook (with personal expenses)	d or c	£85.00
Gensoft — Cashbook V&A (Vat) Accounts	d	£90.00
Gensoft — Cashbook V&A (Vat) Accounts	d	£88.00
Parsons — Accounts Package	d or r	£115.00
Microsystems — Cashbook	d	£175.00
Parsons — Sales Ledger	r	£15.00
Parsons — Purchase Ledger	d	£15.00

### Stock Control systems

Procton — Inventory 84	d	£20.00
Gensoft — Stock Control	d	£25.00
Gensoft — Stock Control	c	£10.00

### Budgeting/Forecasting systems

Commodore — Future Forecaster	d	£75.00
Adamssoft — Budgeteer	c	£8.00

### Home applications

Commodore — Budget Desk	c	£57.00
Gensoft — Home Accounts	d	£18.00
Gensoft — Home Accounts	d	£24.00
Parsons — Home Accounts	d	£78.00
Adamssoft — Checkbook Manager	d	£24.00
Mr. Day — Bank Manager	d	£7.00

### Database/Filing Systems

Gensoft — Pages 84	d	£88.00
Gensoft — Database	d	£24.00
Parsons — Mail Label	d	£28.00
Proforma — Masters 84	d	£78.00
Audiogen — Mailer	d	£88.00
84 — Circle 84	d	£115.00
Procton — Profiles 84	d	£44.00
Procton — SuperBase 84	d	£98.00
Simplex File 84	d	£80.00
Gensoft — Mailist	d	£24.00

### Spreadsheets

Microsoft — Multiplan 84	d	£99.00
Microsoft — Multiplan (2.0 version)	d	£70.00
Herold — Day Calculator	r	£60.00
Herold — Advanced Calculator	d	£88.00
Procton — Procalc 84	d	£44.00
Procton — Procalc 84	d	£30.00
Supersoft — Muscolo 1	d or c	£17.00
Supersoft — Muscolo 2	d	£81.00

### Statistics

Herold — Stat 84	r	£28.00
------------------	---	--------

### Word Processors

84 — Pages 84	d	£58.00
Word — Simple Write 84	d	£40.00
Word — Wordwrite 84	d	£78.00
Word — Wordwrite 84	r	£88.00
Word — Spelling Checker	d	£28.00
Word — Wordwrite + Wordwrite	d	£58.00
Herold — Herowriter	r	£24.00

### Utilities

Adamssoft — Spills Aid	c	£8.00
Adamssoft — Quickchart	d	£8.00
Adamssoft — Screen Graphics	d	£14.00
Adamssoft — UltraBasic	d	£24.00
Adamssoft — Chartpak 84	d	£24.00
Adamssoft — Superdisk	d	£12.00
Adamssoft — Graphics Designer	d	£18.00
Adamssoft — Zoom Pascal	d	£28.00
Audiogen — Parts 84	r	£28.00
Audiogen — The Tool Graphics Manager	r	£48.00

### Mr. Day — Chipman

Parsons — Future Forecaster	d	£13.00
PAI — Assembly	d	£25.00
Commodore — Binary Base	d	£57.00
Burns — BC Base	r	£47.00
Commodore — Logo	d	£57.00
Commodore — Plot	d	£75.00

# SOFTWARE CENTRE

Hextris — Turbo Graphix II	r	£52.50
Hextris — Bomb 64 Advanced	c	£60.00
Hextris — Hextris 64	r	£34.95
ProLynx — Pal-64	d	£75.00
ProLynx — 64-Demon	d	£16.00
SuperSoft — Master 64	d	£75.00
SuperSoft — Master	r	£54.95
SuperSoft — Arise	r	£44.95
SuperSoft — Mike Alexander	r	£59.95
SuperSoft — Graphix 64	r	£75.00
<b>Simulators</b>		
<b>Flight simulators</b>		
Alfons — Pilot 64	d	£5.99
Arctop — Flight Path 707	r	£7.95
FR — Flight simulator	d/d	£34.95
Microprose — Solo Flight	d/d	£14.95
Subtrop — Flight Simulator II	d	£47.95
<b>War</b>		
SDI — Battle for Normandy	d/d	£34.95
SDI — Kingdom of the Desert	d	£34.95
SDI — Tigers in the snow	d	£34.95
SDI — Combat leader	d	£29.95
SDI — Eagles	d	£29.95
SDI — Geopolitics	d	£35.95
Avolon — Napoleon	d	£13.95
Broderbund — Operation Western Front	d	£34.95
<b>Business</b>		
Shuchit — Millionaire: Stock Exchange	d	£50.00
Shuchit — Tycoon (Commodore)	d	£50.00
Shuchit — Irons (Real estate)	d	£50.00
<b>Sport</b>		
SDI — Professional golf	d	£34.95
SI — Artists — One on one (Basketball)	d	£34.95
<b>Educational</b>		
Cell — Essential Italian	d	£16.95
Cell — Essential Italian	c	£14.95
Cell — Jean & Mar (French)	d	£8.95
Cell — Satsago (English spelling)	c	£5.95
Cell — Montparnasse (English spelling)	c	£8.95
Cell — French	c	£5.95
Cell — General knowledge (5-9 yrs)	d	£5.95
Cell — Garage (11-14 yrs)	d	£5.95
Cell — History (5 level)	c	£7.95
Commodore — Biology (C64, C128)	c	£5.95
Cellula — Chemistry (5 level)	d	£7.95
Commodore — Chemistry (C64, C128)	c	£5.95
Cell — General Science (9-11 yrs)	d	£5.95
Cell — Geography (5-9 yrs)	c	£5.95
Cell — Geography (9-11 yrs)	c	£5.95
Cell — Geography (12-14 yrs)	c	£5.95
Commodore — Geography (C64, C128)	c	£5.95
Cell — History (5-11 yrs)	c	£5.95
Cell — History (12-14 yrs)	c	£5.95
Commodore — History (C64, C128)	c	£5.95
Cellula — Physics (5 level)	d	£7.95
CDS — Maths: addition	c	£5.00
CDS — Maths: multiplication	c	£5.00
CDS — Maths: linear equations	c	£5.00
CDS — Maths: quadratic equations	c	£5.00
LCL — Micromaths	c	£34.75
Solo — Time Traveller (History)	c	£5.95
Timeworks — Dungeons of the Algebra Dragons	d	£35.95
Canter — C64 Tutor	d	£34.95
Devilbox — MathMaster	d	£44.95
<b>Tactical books (with cassette)</b>		
Honeyfold — Dr Watson's Beginner's Book		£10.95
Honeyfold — Dr Watson's Assassin		£12.95
<b>Chess</b>		
Autogenic — Grandmaster Chess	d	£17.95
Autogenic — Grandmaster Chess	d	£12.95
CDS — Colossus Chess	d	£12.95
CDS — Colossus Chess	c	£8.95
Sargon II	d	£39.00
Grand Games		
Path — Grandmaster	c	£39.95
Algebra — Bridge	d	£7.95
Advanced — Colossus	c	£5.95
<b>Games</b>		

Cassette cartridge disk US and English. A very wide range including Action, Adventure, Broderbund, Creative, Database, Education, Arcade, Sports, Free Star, Fantasy, Infocom, Parker, Simulation.

# MACBETH

## THE COMPUTER ADVENTURE

A package of four completely different adventures plus four character analysis programs.

Step into the leading role in one of the most complex and intriguing webs of murder, treachery and witchcraft ever conceived.

Use graphics as an integral part of the problem solving.

Written by a highly qualified team of experts.

Even the most experienced adventures will find something new and challenging.

Let your computer stretch your imagination.

FOR COMMODORE 64  
£14.95

WRITTEN AND DESIGNED BY GUYEN LINDSEY (1987/1988)

**CREATIVE SPARKS**

**Respects itself**  
All good computer software respects itself.

**Serials are (not) required**

- ☐ My local shopkeeper's address  
☐ Your list of games  
☐ \_\_\_\_\_ copy/ies of this genius

PRICE 990 as £14.95 each £ \_\_\_\_\_

+ single PLP form 30p

Total to send £ \_\_\_\_\_

**Methods of payment**  
By cheque or by the credit mode payable to TRAC

Order details

\_\_\_\_\_

Sign below

Credit card orders: UK orders only  
Response only in 21 days

Creative Sparks  
Department Ltd  
P.O. Box 10000, 10000  
Parsippany, New Jersey 07054  
Telephone: 02021 518364

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CH1204

# Drawing on the 64's artistic abilities

**C P Whitcombe looks at three graphics packages — two for budding painters, one for handling sprites**

NO DOUBT, dear reader, you're someone with most other 64 owners you have a love/hate relationship with your electronic mouse. We all know that the 64 has excellent sound and graphics capabilities, but we are also painfully aware that it is not easy to get the best out of this machine. One tool helps in its hand with an ever increasing number of software packages designed to do many with some of the more long-winded procedures required by C1800 users. Three such offerings are Paint Pro, from Krome, Paintmaker from Telenex, and Macromind's GoSprite.

Paint Pro is a window-based colour drawing program, which offers you a blank screen upon which you can let your artistic talent run wild using a do-dasher cursor or a pen. There are 4 different coloured pens available in any one mode, enabling you to draw in 3 colours (you 0 in the background colour) at the touch of a button. Pens, borders and custom colours can all be changed by single key operations. In pen mode you draw lines, points or lines of one dot width. In brush mode this can be expanded to give thicker lines up to eight dots wide. Other commands available in this mode allow you to have 3 colours on the brush at the same time, which can be rotated along the brush length to give repeated colour patterns.

## Help!

There are various standard shapes which the program will draw for you, including straight lines, triangles, circles, ellipses and arcs. All the closed shapes can be pen filled by switching on the appropriate colour before pressing the required command key. In addition to pen and brush, there is a text mode which permits the use of the 64 character set anywhere on the screen. If you have done something that you particularly like, you can duplicate it, rotate it or, better or smaller, the exact way round or inverted.

Although it is possible to draw quite pretty pictures with Paint Pro it is rather slow and generally not very impressive. The built-in screens are poorly designed and, as such, we're HELP'ed all. The same applies to the manual. At £19.95 I find Paint Pro overpriced. Contact Krome at Unit 15, Hawthorn Park, Hawthorn Road, Pangbourne, Berkshire, RG12-0L5.

Paintmaker, on the other hand, is really

rather good. Whilst the type was loading I stopped through the manual and was pleased to see that it was well-written and quite easy to follow.

The first screen is covered in a mass of all the 0s and 1s key commands along with their functions (e.g. F01-F05 Colour). Flipping the SPACE bar will take you to the Pattern Screen. Hit it again and it's back to the MENU.

At the bottom of the Pattern Screen is a 'ctrl' line which gives the program tasks (e.g. control custom patterns (0-9) format) colour and pattern selected and one or two other bits of useful information. If you want to get the bottom right lines of the picture you can turn the 'ctrl' off.

To move the cursor about you use the cursor keys in (basic stuff) a keypad on Port 2 is useful at quite a steady pace at first, but things get fast and furious if you hold the track over! Pressing the FIRE button will place a dot in the cursor position. You can move a point by selecting the background colour and overwriting the trace. To draw a trail of points, just hold down FIRE and keep going!

If you make a complete loop of things

you can wipe the whole screen before starting another. For those with something less than 256K memory, the screen around the cursor can be magnified. But the job for those important last pixels! As with most programs of this type, you don't have to worry about saving or doing 'pattern' screens or all the regular' things are taken care of for you. Drawing on ellipses, for instance, only requires you to black the 3 lines (0-2) and a point on the circumference. The end is close for you.

In discovering some of your limits in the wrong place, worry or not. Type 2 and Hit' any part of the off-screen trace with the cursor — it simply disappears.

Nothing is complicated with Paintmaker. Even making pretty coloured patterns is easy, using the 01 (Define Pattern) command. A Pattern (in this context) is a block of 64 (half) pixels filled with dots in the pattern of your choosing. You can Define 22 of these blocks, labelled 0 to 21. A slight bug here displays them in the wrong order, but never mind!

## Placing

Select your feature block whenever you wish and place anywhere on the screen. Shapes can also be filled with other blocks in place of 'straight' colour. A set of BLOCK commands permits the transportation of any particular feature to a different point of the screen, either as an identical copy or as a mirror image (the manual is rubbish). To move a block, a small diamond the Drag command is the one to use. To move a block use Block Enter (when this which does the marked screen but leaves the rest of the screen intact). A Text command allows the use of any letters or numbers from the keyboard. You cannot use the Graphical symbols, although this does not present any problems as you can make your own Graphical characters using the Define Feature routine.

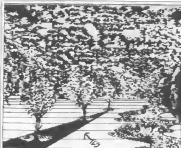
When you picture your screen



Paint Pro — pretty pictures if you have the patience

100





*Purview — excellent results, good manual*

As you must remember that a block of 64 Pixels can only have 3 colours: 1 foreground and 1 background. Each can, however, have any combination of all the available colours so there is plenty of scope for the three colours amongst you. It is, perhaps, advisable to draw your original sketch on top of the double-board screen colour scheme. This will show you where the rules of each colour block are so that you can get as many of your lines as possible to coincide with these edges. With a combination of good colour schemes, Defeat Feature, a little forethought and your own unsketched sketch, creative results can be achieved which you can store on Tape or Disk for later retrieval.

As you have no doubt gathered I liked this program a lot. It was fun! It's very easy to follow and even I managed to get the hang of it quite quickly. As I mentioned before, the manual is unusually good. Full marks, almost I don't like the case totally flaking corners, but then I've got to find something to mean about, haven't I? Price is £17.95 on tape or £19.95 on disk. Contact Tolson at Games Building, 188 St James Road, Glasgow G4 3JZ 0262.

## Sprites

If you've ever tried programming the double-board into your 64, then you will know what a jolly task it is! Anything that program to remove some of the tedious overhead has got to be worth a look.

Go Sprit is a cassette program that enables the user to draw up to 50 sprites on the screen and try them out in any sequence. The first screen shows in the top on which you draw the shape of your fantasy. This is made up of an enlarged and clear dragging box, a sprite marker box which shows what it really looks like right in size and colour and a set of commands (K.O.B.s). All that is required to enter an animation is for you to place the cursor

over the appropriate icon and hit the 'Fire' button. A long bar bottom of the screen is a Point Box, the values being selected in the same way as commands.

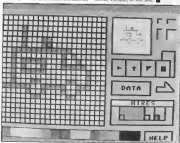
Each square on the large grid represents one dot of the screen which will appear as blue when 'lit', or a white background colour when it is 'not lit'. When drawing in the Hires mode you are limited to 2 colours: 1 foreground, 1 background. In Multicolour mode there is the added structure of 3 foreground and 1 background, but as a price. The definition is not as good because each vertical column is now 2 dots wide. On completion of the design, the sprite can be viewed back to front, upside down, stretched horizontally

in vertically, or in Negative form. This reverses the foreground and background colours. You can, of course, draw the screen should you make a fool of yourself! Once happy with your creation, you go to the next screen for sprite selection and saving. At the top is a 'Carousel' of 7 windows. Below is a Selector which allows you to scroll any of your 50 sprites into view, 7 at a time. Each of the sprites is assigned a position in the Priority Stack. This decides which will be in front of which if superimposed. The resulting drawing can be seen in the sprite Display box. Whilst at this stage you can copy or erase any design.

## Animation

Finally we arrive at the Animation Screen. This is where things really start to happen. This is a where you're running down one side, the 'Film' Running screen is a version of the 'Carousel' from the previous screen. Sprites are transferred onto the Carousel as and when required in order to make up an animated sequence of up to 256 frames.

When the film is run the final result of your labour will be revealed in all its movie splendour. Once you are satisfied that the sequence is correct, you can prepare your sprites for use within your own programs. To do this you need to convert them into Gene data statements, using the GEN/VRST program so kindly supplied on the B side of the GO-SPRITE tape. (Although it is an exercise don't be put off, it was Pandemonium so takes under 3 minutes to become operational). All the contents have HALP lines which refer you to a section in the manual. I especially like the use of lines; it makes it all so much clearer — and better! Everything works. Not a bug in sight. This is the sort of standard all software packages should aim for. Bazzanti, Go Sprit costs £2.95 from Martindale, the Mirror Group, Biddons Circus, London, SE 13 5AR. ■



*Go Sprit — not a bug in sight*



```

59 A=0:B=0:C=0
60 A=C:100
61 A=C:200
62 A=C:300
63 REM--POKE--IN--SCENARIO--DATA--
64 IF POKE(2)=3 THEN 171
65 POKE2,3
66 FOR#0 TO 3
67 FOR B=1 TO LEN(A$)
68 C=ASC(A$)+ASC(A$)*B:100
69 B=1
70 IF C=200 AND C=212 THEN B=0
71 IF C=135 THEN B=0
72 IF C=199 THEN B=0
73 IF C=200 THEN B=0
74 IF C=201 THEN B=0
75 IF C=64 THEN C=C-128
76 POKE (4444206)+((25000)+(B-1)*1824),C
77 POKE (4444206)+((25000)+(B-1)*1824),C
78 NEXT B:PRINT#10 "PRESS RETURN TO START"
79 GET#1:IF ASC(CHR#113) THEN 100
80 GOTO1
81 M=1824
82 FOR#0 TO 40:POKE16732+R,32:POKE16900+R,32:NEXT#
83 FOR#0 TO 40:STEP 2
84 POKE16732+R,71:POKE16732+R,72:POKE16900+R,72
85 POKE16732+R+6,POKE16732+R+6,7:POKE16900+R+6,7:NEXT R
86 IF#0 THEN POKE16900,32:POKE16910,32:POKE16960,32
87 FOR B=0#255 TO 255#255 STEP 2
88 POKE16732+B,72:POKE16900+B,72
89 POKE16732+B+6,POKE16900+B+6,2:NEXT B
90 POKE33249,3:POKE33249,100:POKE33249,172:POKE33249,200
91 SYS10432
92 IF POKE(251)<10 THEN R=POKE(33279)
93 IF POKE(33279)AND1=1 ANDPOKE(251)<110 THEN POKE2040,212:GOTO470
94 Z=1:IF Z=0 THEN 200
95 Z=1-INT(0.7):GOTO0:300
96 IF E=0 THEN POKE2040,F:E=1:GOTO330
97 IF E=1 THEN POKE2040,F+1:E=0
98 GET#1:IF#1 THEN 300
99 POKE33250,200+K
100 IFPOKE(1377)=12800 FOR K=1 THEN K=1
101 IFPOKE(1377)=20400 K=2 THEN K=0+1
102 IFPOKE(251)>150 THEN 300
103 IF POKE(251)>120 THEN 200
104 IF POKE(251)>100 THEN 250
105 IF#0/" AND#0THEN N=1:I=0:J=0
106 IF 0=0 THEN 0=1
107 IF 0=1 THEN F=200:POKE2040,F
108 IF#1 THEN 297
109 IF I=0 THEN POKE33249,POKE(33249)+3
110 IF I=1 THEN POKE33249,POKE(33249)+3
111 J=J+1:IF J=4 THEN I=I+1:J=0
112 IF I=2 THEN N=0
113 IF POKE(251)>110 THEN 310
114 GOTO 210
115 IFPOKE(251)>115 ANDPOKE(251)<118 THEN L=0:N=0:F=210:POKE2040,210
116 IF L<0/2 THEN N=1:L=0:R=POKE(33279)
117 IF N=1 THEN 300
118 POKE33249,POKE(33249)+3:L=L+1
119 GOTO 210
120 IF POKE(33249)=172 THENF=200:POKE2040,F:L=0:N=1:GOTO300
121 IFPOKE(33279)AND 1=1 THEN 470
122 POKE33249,POKE(33249)+3:L=L+1
123 GOTO210
124 REM
125 REM
126 REM

```

© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 399–405

# DO YOU HOVER AROUND WAITING FOR BASIC?

**D.T.L. BASIC™**



is a Basic Compiler for the  
68000. It converts a Basic  
Program into Pseudo Machine  
Code which runs much faster and  
is smaller, leaving more RAM for you

•100% compatible with C.B.M. Basic  
•Compiled programs may run up to 25 times faster  
•Users saving package collection fee is included  
•Users saving machine code routines without attention  
•Can compile extensions to Basic  
•Compromises program making a  
essential fast  
•Handles both floating point and integer  
variables  
•Full syntax error checking while compiling  
•Cross reference and checks all GOSUB and GOTO's  
•Contains a cross checking error locator program for use if  
your program crashes while running

**D.T.L. Basic "Jetpack" is available on  
tape or disc.**

Apple II version: £14.95 inc. postage  
Amstrad version: £14.95 inc. postage

Note: The tape version is tapeboxed containing a maximum 12000 bytes



**USE**

**D.T.L. BASIC™**



**...IT'S A LOT LESS  
BOYVER!!**

Available from all good computer retailers or direct

## PRIORITY MAIL ORDER

Please send me:

Further information ☐

Jetpack tape ☐

Jetpack disc ☐

(please add £1.00 p.p.)

I enclose Cheque/Poundnote for £  
Off in cash to partly ACCREDITATION

Name

Company

Address

Post Address

Signature

To: **DATANEW MICROGRAPH LTD**

VERBODEN ROEGEN, "Blaasbaai" 1000

**COLCHESTER, ESSEX, ENGL. SS500 8BQ**

040

## EXPERIENCE THE STUNNING 3-D REALISM OF **DYNIBOX**



```

399 IF(PEEK(33279)/AND1)=1 THEN 400
399 G=1 GOTO458
400 F=212 POKE2848,F
400 REM
405 FORL=1 TO 50 NEXTL
405 SVS10784 GOTO500
470 REM---
475 POKE2848,212
475 IF PEEK(33248)/171 THEN 493
490 POKE33249,PEEK(33249)+2 FORL=1TO10 NEXTL GOTO470
490 GOTO 450
500 IF (G=0) THEN 530
505 PRINT"*****      * * SMALL JOKE ON * * SC=SC+1
505 IF V=6 THEN PRINT"*****",SC PRINT"END", GOTO500
507 FORR=1TO1500 NEXTR
508 POKE628,SC POKE629,L1 POKE630,V
509 CLR
510 SC=PEEK(628) L1=PEEK(629) V=PEEK(630)
520 V=V+1 PRINT"IT" POKE2848,288 F=288 GOTO1
530 PRINT"*****
531 FORR=1TO1500 NEXTR
532 POKE628,SC POKE629,L1 POKE630,V
533 CLR
534 SC=PEEK(628) L1=PEEK(629) V=PEEK(630)
535 L1=L1-1
570 IF L1<0 THEN PRINT"IT" POKE2848,288 F=288 R=PEEK(33279) GOTO1
575 PRINT"*****
580 PRINT"MM GAME OVER. PRESS RETURN TO REPLAY."
590 GETM:IFM<CHR$(13) THEN 590
595 F=288 POKE2848,F R=PEEK(33279) POKE33289,0 POKE33249,172
597 POKE33248,0 POKE33249,0 RUN
600 FORR=1TO1000 NEXTR
610 POKE628,SC POKE629,L1 POKE630,V
620 CLR
640 SC=PEEK(628) L1=PEEK(629) V=PEEK(630) RETURN
660 REM
680 POKE34276,0
690 POKE34278,12
800 POKE 34277,12
840 POKE 34276,129
850 POKE34273,58
860 POKE34276,128
870 RETURN
900 REM
930 POKE34276,32
940 POKE 34276,33
960 POKE34276,32
970 RETURN
980 REM
1000 IF PEEK(2)=3 THEN 1
1005 PRINT"*****      *****      *****
1010 PRINT"MM      * *      * *      * *      * *
1020 PRINT"*****      * *      * *      * *      * *
1030 GOSUB 1590 GOTO1
1040 REM---POKE---IN-OUT
1050 R(0)=((344096)+1624
1060 R(1)=((3.344096)+512
1070 R(2)=((444096)+2840 B=0 C=0
1080 RESTORE
1090 IF B=3 THEN 1400
1100 READ R IF R=-1 THEN B=B+1 C=0 GOTO1580
1110 POKE R(0)+C,R
1120 C=C+1
1130 GOTO 1090
1400 POKE36334,PEEK(36334)/AND254
1410 POKE1,PEEK(1)/AND255
1420 FORB=0 TO 511 POKE(2.344096)+R,PEEK(R+53248) NEXTA
1430 POKE1,PEEK(1)/OR4

```

Continued on page 89

## Superbase 96

Superbase 96 is the most powerful database system available for the Commodore 64. It is a full-featured, multi-user database system that can handle up to 100,000 records and 100,000 fields. It is easy to learn and use, and it is a great value for the money. Superbase 96 is available in two versions: a full version and a demo version. The full version is \$49.95 and the demo version is \$19.95. Both versions are available on disk or tape. Superbase 96 is a great choice for anyone who needs a powerful database system for their Commodore 64.

## Superscript II

Superscript II is a powerful word processing system for the Commodore 64. It is a full-featured word processor that can handle up to 100,000 characters and 100,000 lines of text. It is easy to learn and use, and it is a great value for the money. Superscript II is available in two versions: a full version and a demo version. The full version is \$49.95 and the demo version is \$19.95. Both versions are available on disk or tape. Superscript II is a great choice for anyone who needs a powerful word processing system for their Commodore 64.

## Master

Master is a powerful spreadsheet system for the Commodore 64. It is a full-featured spreadsheet system that can handle up to 100,000 cells and 100,000 formulas. It is easy to learn and use, and it is a great value for the money. Master is available in two versions: a full version and a demo version. The full version is \$49.95 and the demo version is \$19.95. Both versions are available on disk or tape. Master is a great choice for anyone who needs a powerful spreadsheet system for their Commodore 64.

\*\*\* PART 21 INFORMATION \*\*\* Call 800-850-0000 \*\*\* 800-850-0000

Item #	Item Name	Price	Item #	Item Name	Price
101	Superscript II	\$49.95	102	Superscript II	\$19.95
103	Superscript II	\$49.95	104	Superscript II	\$19.95
105	Superscript II	\$49.95	106	Superscript II	\$19.95
107	Superscript II	\$49.95	108	Superscript II	\$19.95
109	Superscript II	\$49.95	110	Superscript II	\$19.95

Master is a powerful spreadsheet system for the Commodore 64. It is a full-featured spreadsheet system that can handle up to 100,000 cells and 100,000 formulas. It is easy to learn and use, and it is a great value for the money. Master is available in two versions: a full version and a demo version. The full version is \$49.95 and the demo version is \$19.95. Both versions are available on disk or tape. Master is a great choice for anyone who needs a powerful spreadsheet system for their Commodore 64.



Calco Software, 10000 E. 1st Ave., Suite 100, Denver, CO 80231, Tel: 303-733-1000

## Pro Productions

## CBM 64 Software



### FLIGHT SIMULATOR

Play your way! Set in the cockpit of your choice, at 10,000 feet, you'll experience the thrill of flying. The controls are off, light and sound, for realistic performance. **Comes with \$1.95**

### YANTRIX

Put the new skills and Challenge your game. Yantrix is a puzzle game that can be played on the Commodore 64. It is a great choice for anyone who needs a powerful puzzle game for their Commodore 64. **Comes with \$1.95**

### PLAY GOLF

Take up the challenge today! Golf on the 18 holes per 30 course. Play in 100 Yards and more. The game is perfect for anyone who needs a powerful golf game for their Commodore 64. **Comes with \$1.95**

### ASSASSIN

Help yourself to learn how to write, read and copy your own machine code programs. Learn knowledge of machine code is a great value to maximize the use of 64000. **Comes with \$1.95**

### SHOOTING

Shooting is a great choice for anyone who needs a powerful shooting game for their Commodore 64. It is a full-featured shooting game that can handle up to 100,000 shots and 100,000 lines of text. It is easy to learn and use, and it is a great value for the money. Shooting is available in two versions: a full version and a demo version. The full version is \$49.95 and the demo version is \$19.95. Both versions are available on disk or tape. Shooting is a great choice for anyone who needs a powerful shooting game for their Commodore 64.

For more information, call 800-850-0000 or visit our website at [www.calco.com](http://www.calco.com).

Name	Flight	\$1.95
Address	Yantrix	\$1.95
	Play Golf	\$1.95
	Assassin	\$1.95
	Shooting	\$1.95

For more information, call 800-850-0000 or visit our website at [www.calco.com](http://www.calco.com).

## REFINISHED GAMES FOR VIC 20/COM64

**VIC20 CHERRY** Available game of tactical and action. Battle and command units in tactical and all the main roles of modern warfare. **Comes with \$1.95**

**LEAGUE SOCCER** League into game for 2-4 players with realistic soccer. **Comes with \$1.95**

**WHEELMASTER** 12 points have perfect for ability of Master. Master is a full-featured word processing system for the Commodore 64. It is a full-featured word processor that can handle up to 100,000 characters and 100,000 lines of text. It is easy to learn and use, and it is a great value for the money. Master is available in two versions: a full version and a demo version. The full version is \$49.95 and the demo version is \$19.95. Both versions are available on disk or tape. Master is a great choice for anyone who needs a powerful word processing system for their Commodore 64.

**TOP OF THE POPE** Easy to learn game about the world. **Comes with \$1.95**

**ELECTION NIGHT SPECIAL** Easy to learn game about the world. **Comes with \$1.95**

**PARTY 4** Four games to match the program of your game. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

**NEW! ADULTS ONLY** Four games for 2-4 players. **Comes with \$1.95**

## TURN YOUR COMMODORE 64 INTO A PROFESSIONAL MICROCOMPUTER



**FIELDMASTER** high quality programs are for the business user of the home computer.

The very latest programming techniques have been used to create clear, easy to use software that might be the finest value available.

We have a program for all your needs:

Powerful spreadsheet, full function 80 column word processor, versatile "card index" database, accurate management, and even a logo & poster printer.

For applications in small business, education, the professions, industry and the home.

Prices from \$21.95 to \$64.95 inc. VAT (tax and disk).

Free "how-to" information on disk or direct.

From us by our field master software.

Accessories and more software.

For a 1988 copy of our software guide, please write to us at:

Fieldmaster Software Company

Box 100, 10000 E. 1st Ave., Suite 100, Denver, CO 80231, Tel: 303-733-1000

Fieldmaster Software Company



# The WYSIWYG principle

Three business programs investigated by Trevor Doherty — a word processor and two spreadsheets  
And WYSIWYG explained

A WORD PROCESSOR is often one of the first "serious" pieces of software in which personal computer owners invest. The Commodore 64 is one of the best home computers for word processing, due to its excellent keyboard and readily available printers and disk drives. A large number of 1541 disk drive owners were fortunate enough to get a free copy of Commodore's own EasyWriter word processor with their drive — which is exactly as it is sold a lot of Commodore printers.

Because so many people already have EasyWriter, a software house selling a real word processor must have an uphill struggle, with a large chunk of the market unlikely to buy their product, however good.

## Perfection

Any word processor must have certain fundamental features. The most basic allow text to be typed in from the keyboard, viewed on the screen, edited and stored as a document, printed out and then stored for later retrieval. The ability to perform these, plus additional features that most of the better processors allow, means that with a two-fingered typist can produce a perfect printed copy.

Wordcraft 64 (149.95, disk) is the latest version of a word processor with a long pedigree on Commodore machines. The program comes with a "dough" processor device which plugs in to portack port two. There is a 60-page manual and a little card which fits round the 64's Function keys and

shows their use — an idea which shares the overall thought which has gone into the product.

On loading the program you are confronted with a load of colorful errors (fortunately I quickly learned to change the colours in watching more carefully). Wordcraft works on the WYSIWYG principle — What You See Is What You Get.

Wordprocessors fall into two categories, those which format an output to the printer and those which format as you type. Wordcraft falls into the latter category. You type on the screen the way you want it to appear in the printed output. I'm afraid that I'm not convinced that this method is actually successful on the 40 columns screen available on the 64 — the screen scrolls sideways to allow a typical 80 columns document to be typed and you have to scroll from side to side to read the finished document on the screen. One advantage of this method is the text isn't covered with embedded format commands.

Wordcraft uses a " ruler " a colored bar across the screen on which you set margins and tabs. This feature is very easy to use. Other features include undo and repeat — for example, you ask the processor to find every occurrence of the word "bank" and replace it with "bay". The ability to take text from one document and combine it with another is provided with the "merge" facility, and a "fill" facility allows names and addresses to be entered once and stored in a list. Data moves from

within the processor is very easy, and text files can be loaded by setting up the directory and using the cursor to highlight the current file to be loaded — no need to remember the exact name.

The ability to output text to a wide range of printers is one of Wordcraft's strongest features. Each printer supported has a printer definition file on the disk, covering a good range of the most popular printers. My HP90 800 worked fine. The clever thing is that if you have an unusual printer you can define your own printer definition file and save it on the disk, surely half the manual is devoted to that useful feature.

Conclusion? A product of the highest standard, particularly strong on printer support, good value for money. But I'm afraid I wouldn't get on with the sideways scrolling on the screen of a document wider than 40 columns.

## Formatting

A spreadsheet is another piece of software likely to be high on the list of non-games software purchases. A spreadsheet allows the computer screen to be used as a large sheet of paper ruled into rows and columns by drawing the screen into a series of "cells" referenced A1, B1 etc. Rather like playing Battleships.

Usually any task that can be done with a calculator and pencil can be carried out and subsequently stored for future use in printed form. One of the advantages has been set out: it is this way in which individual figures and the effect on the other spreadsheet figures. Thus if you had a sheet showing your household budget you could see the effect of, say, a higher mortgage repayment on your finances. This feature is called "what if" calculations.

One feature which most spreadsheets offer is "copying", the ability to copy a cell or range of cells to that similar calculations can be carried out elsewhere on the sheet. This allows, for example, similar headings to be carried over on each of twelve monthly columns by just defining the calculation in the first month and then replicating it. I use a spreadsheet to help to carry out many tasks, such as keeping track of my bank account.

Automatic 64 (129.95, disk, £14.95 tape) is a recent entrant in the market. It is advertised as a "100% machine code" which should give it a speed advantage over its rivals which are partly or wholly in Basic. In practice I found the speed advantage was slight and negated by other disadvantages.

## Comment

After loading Automatic you define the size of the blank sheet, and the screen displays the familiar spreadsheet format of rows and columns plus a command line. The first time I tried to use it I tried to type in some headings but found I couldn't get anything to appear on the screen, a display examination of the 8-page booklet provided (which gives details of each of the 39 functions contained) showed me that in order that you have to press "F1" and then press the function key before you can type a heading or label into a single cell. This was



Wordcraft 64 — a profile of the display standard



doing apples with 'A' for data and 'T' for formula. This seems to be a tedious arrangement, and I found the extra three key strokes per cell slowed down use. Other spreadsheets are able to distinguish between labels data and formula input by the usual key strokes.

#### Features

Acornote also strangely blocks the screen during such calculations, a limitation other spreadsheets avoid. Calculations can be an input by using the comma and 'A' to automatic calculation can be selected, but this strangely takes place when you perform a subsequent operation, not immediately following entry of the number in question.

Two features I did like very much were the ability to change the width of individual columns, and the 'home' key which takes you back to cell A1 from anywhere on the sheet. No facilities are offered to insert extra columns / rows, delete them or move about. It is possible, however, to delete the contents of an individual cell. A limited replicate function is available allowing single cells, rows, columns or blocks of cells to be copied, but not expanded. Thus you cannot easily carry out similar calculations in each of several columns without entering them all individually.

Each time you type something in and press 'return' the cursor jumps to a distance dictated by as previous movements, unusual and annoying. Much more serious was that I managed to 'crash' the program twice. The first was caused by the 'command-line' at the bottom of the screen not being protected. I inadvertently used the cursor key and typed in the wrong place on the screen. When I pressed 'return' the program crashed. The second occasion was when I incorrectly tried to save a file to tape instead of disk.

To sum up I'm afraid I cannot recommend this product, despite the comparative price. There are better spreadsheet alternatives for the money, for instance SuperCalc's *RealCalc*.

PS (249.95, disk) is a spreadsheet with a difference. What sets it apart from others

#### ACORN 64 PROGRAMMER'S COURSE

Available for the 64 is a facility which has you add functions by programming your own, or third, saving them on disk and recalling them from within the spreadsheet. This powerful facility means that the spreadsheet can be customised to carry out spreadsheet calculations beyond the ability of a normal spreadsheet.

PS is based on *Protable* and offers the same facilities, with the addition of the programmable function. PS comes with a 125 page manual divided equally between the standard *Protable* features and the additional PS features.

Single words will be used as a time, although the may be expanded into a range of basic cells insert, delete and move facilities are all provided.

PS has some unusual facilities which are not often seen in 64 spreadsheets. You can change the representation of numbers in graphical format, and use 80x100 pixel graphs, which look very good printed or on the screen. PS allows you to sort both alphabetically and numerically and to search for a number, word or formula. Time can be fixed so that they do not scroll off when moving round the screen. All the above features are shared with *Protable*.

#### Facilities

The unique PS programmable facility is covered in the second part of the manual, twelve additional facilities are described and included on the disk to get you started. Examples include a facility to carry out a sort in primary and secondary order and a feature to erase all the data from your sheet while leaving the index intact. Program listings are given in the manual so you can see how it is done. The possibilities are limitless. To use the programmable facility you first recall your program from disk and then execute it as often as you like at the relevant place on your spreadsheet. Only one add-on module may be used at a time, but several could be called, one after another from within the same spreadsheet.

I think PS is an excellent product, but the market for it is limited to those who need more than a good ordinary spreadsheet can provide. If you don't need the add-on, *Protable*, which is about £15 cheaper would seem a good bet. ■

Programmable Spreadsheet - priced 249.95

**Custom software:**  
Woodstock 64, Dawson Woodcock Ltd, 184a Hove, East Street, Colchester, Essex, CO2 6JH  
Michael Shepherd Software, 21-25 Elmwood Lane, Coptham, Hove, Brighton, BN1 6JH  
Procomp, c/o Public Image PB, 62 Tottenham Court Road, London, W1P 0JH



# COMMODORE SOFTWARE FILE

## Split screen

A feature of *Supersoft* needs this 64 program:  
**THIS IS A Basic loader program which**

creates a split screen. The 64 can window area is variable, by POKEing 26429 with the next coordinates and 26430 with the end coordinate of the window area required. SYS26419 calls the routine and SYS26448 turns it off. The program uses hardware interrupts and timer values to change the

graphics mode of the screen to display points. It would be ideal for creating a split screen such as those used in adventure games, with text in the lower half of the screen and icons/graphics in the upper half.

Other applications are limited only by your imagination!

```
10 R=26033 T=0 C=0
20 READ IFD=1 THEN H40
25 FORER,D T=T+D R=R+1 C=C+1
30 GOTO 38
40 IF T>16788 THEN PRINTCHR$(147) PRINT " DATA VALUE ERROR" END
42 IF A<50483 THEN PRINTCHR$(147) PRINT " NUMBER OF DATA ITEMS ERROR" END
50 PRINTCHR$(147) PRINT " USE SYS(26033) TO CALL HIRES WINDOW"
52 PRINTCHR$(17) PRINT "   SYS(50446) TURNING OFF WINDOW"
54 PRINTCHR$(17),CHR$(17),CHR$(18)," TO CHANGE AREA OF HIRES WINDOW"
56 PRINTCHR$(17)," USE POKE50439,Y FOR START OF WINDOW"
58 PRINTCHR$(17),"   POKE50410,Y1 FOR END OF WINDOW"
60 PRINTCHR$(17)," HIRES WINDOW AT 8192 TO 16191 LH MEM"
62 PRINTCHR$(17)," USE NORMAL CLEAR HIRES AREA ROUTINE"
64 PRINTCHR$(17)," IE. FORC=8192 TO 16191 POKEX,0 NEXT"
66 PRINTCHR$(17)," ADJUST COLOUR MEM FROM 1624 TO 2623 TO"
68 PRINTCHR$(17)," SUIT AREA RESERVED FOR HIRES WINDOW"
70 END
100 DATA120,169,197,141,20,3,169,196,141
101 DATA21,3,173,17,208,41,127,141,17
102 DATA208,169,151,141,18,208,173,26
103 DATA208,9,1,141,26,208,88,96,169,1
104 DATA44,25,208,208,3,76,49,234,173
105 DATA17,208,200,27,248,3,76,249,196
106 DATA173,17,208,9,32,141,17,208,173
107 DATA24,208,9,9,141,24,208,169,151,141
108 DATA18,208,169,1,141,25,208,184
109 DATA168,184,178,184,64,173,17,208,41
110 DATA223,141,17,208,169,21,141,24,208
111 DATA169,9,141,18,208,76,238,196
112 DATA128,169,49,141,20,3,169,234,141
113 DATA21,3,173,17,208,41,223,141,17
114 DATA208,173,24,208,41,247,141,24
115 DATA208,173,26,208,41,254,141,26,208
116 DATA88,96,-1
```

## Ski slope

This game for the unimproved 16.25 comes from *Shell Skislope* of Wiprosoft

THE OBJECT of *Ski Slope* is to avoid the trees for as long as possible while following jumps and demands. If you take a jump you get extra points but to do this you must be going at least at medium speed. You get a bonus life after 5000 points, and

the game changes after three minutes.

Use the cursor keys to move left and right, and control your speed with X for slow, Z for medium and L for top speed. Break a leg!

```
5 PRINT"### SKI-SLOPE M BY MULL"
10 PRINT"### USE CURSOR KEYS FOR MOVEMENT LEFT AND RIGHT."
15 PRINT"### S=SLOW SPEED,STARTING SPEED."
20 PRINT"### Z=MEDIUM SPEED."
30 PRINT"### C=TOP SPEED."
```

Continued on page 44

```

31 PRINT "PRESS A KEY."
32 GET I: IF I#"" THEN GOTO 35
40 SC=0:DN=0:HT=0:JP=0:LI=3:TI#""000000":LJ=1:LK=1:POKE257,120
50 L=7910:Q=20
60 POKE 36876,6:POKE 36877,120
60 PRINT "DN"
70 PRINT "*****"
75 PRINT "*****"
90 GOSUB 1000
95 IFPEEK(L)>99 THEN 300
96 IFPEEK(L)>99 THEN SC=SC+10:Q=1:DN=DN+1:IF Q=5 THEN SC=SC+10
97 IFPEEK(L)>99 THEN SC=SC+20:Q=1:HT=HT+1:IF Q=5 THEN SC=SC+20
98 IFPEEK(L)=182 THEN GOTO 3500
100 POKE L+8:POKE L+38720,0:POKE L2,32
102 IF Q=1 THEN Q=0:GOSUB 3100
105 L2=L-22
110 FORPR=1 TO 9:R=PEEK(197):NEXT
120 IF R=31 THEN L=L-1:GOTO 140
130 IF R=23 THEN L=L+1:GOTO 140
132 IF R=33 THEN Q=10
133 IF R=26 THEN Q=15
134 IF R=34 THEN Q=1
135 IF RND(1)<.05 THEN GOSUB 2500
140 IF L=7908 THEN L=7901
150 IF L=7921 THEN L=7920
160 SC=SC+1:IF Q=1 THEN SC=SC+1
170 IF Q=1 THEN SC=SC+1
174 DFLK=IANDVAL(TI#)>480 THEN SC=SC+500:LK=0
176 IF LJ=1 AND SC>3000 THEN LJ=0:LI=LI+1
180 GOTO 90
300 POKE LI,42:POKE L2,42
305 POKE 36877,0
310 FORPR=1 TO 200: NEXT
320 LI=LI-1:IF LI=0 THEN H=0
330 GOTO 50
400 PRINT "SCORE=",SC
401 PRINT "DN"
402 PRINT "HT"
403 PRINT "JP"
404 PRINT "TIME=",TI#
410 IF SC=0 THEN HC=SC:PRINT "NEW HIGH SCORE!!":GOTO 440
420 PRINT "DN HT=SCORE=",HC
440 FOR PR=1 TO 1000: NEXT
450 PRINT "PRESS SPACE TO PLAY"
460 R=PEEK(197):IF R>32 THEN GOTO 460
470 GOTO 40
490 END
1000 X=INT(RND(1)*20)+1
1002 IF RND(1)>.5 THEN G=INT(RND(1)*16)+1:PRINT TAB(X);"+*+*+":GOTO 1020
1005 IF RND(1)<.1 THEN PRINT TAB(X);"*" GOTO 1020
1008 IF VAL(TI#)>3687 THEN PRINT TAB(X);"*" GOTO 1020
1010 IF Q=16 THEN X=X+5
1012 IF VAL(TI#)>3000 THEN PRINT TAB(X);"+*+*"
1020 LI=RIGHT$(STR$(LI),1):PRINT "SCORE",SC,"TIME",RIGHT$(TI#,3)"M",LI
1020 PRINT "*****"
1040 RETURN
2500 REM RAMP
2505 RI=INT(RND(1)*20)+1
2505 RI=RI+6675
2508 FOR L=RI TO RI+118 STEP 22:POKE L+38720,0:NEXT
2510 POKE RI,182:POKE RI+22,00:POKE RI+44,00:POKE RI+66,00:POKE RI+88,00
2520 RETURN
3000 REM HOUSE

```

```

3100 POKE36878,15
3105 POKE 36877,8
3110 POKE 36876,228
3120 FOR M=1T05 NEXT
3130 POKE 36876,8 POKE 36877,128 POKE36878,6
3140 RETURN
3499 REM JUMP
3500 IF Q=15 THEN 100
3510 IF Q=1THEN 35=6
3520 IF Q=18 THENR=4
3525 POKE L-22,32
3530 GOSUB 1888 POKE L,8 POKE L-22,32
3535 FORPR=1T00 NEXT
3550 FOR Q=1T08
3560 GOSUB 1888
3570 FORPR=1T0 8 NEXT
3580 POKE L,8 IF Q=1THEN POKE L-44,102
3590 POKE L-22,88
3600 NEXT
3610 IF PEEK(L)+22=88THEN 368
3615 8C=8C+58
3617 IF 8=1T048N 8C=8C+8C
3619 JP=JP+1
3620 GOTO 168

```

## Bongo Maniac

Here's an expanded Bongo program that  
 adds Carols and Stephen Ward's

### Musicbox

THESE THREE short sound and graphics  
 routines could be incorporated into your  
 own programs.

The first is Computer Music, which is  
 the sound of a computer going mad.

The second is Synthesized Carols, which  
 gives a synthesized sound and other  
 effect.

The last is Bongo Drum, which repre-  
 sents the sound of someone beating wildly  
 on the bongos.

```

2 PRINT"*****"
3 PRINT"HELLO I AM A COMPUTER MANIAC"
4 PRINT"0-----"
5 PRINT"*****"
10 POKE36878,15
20 C=INT(RND(1)*50)+175
30 S=INT(RND(1)*250)+1
40 POKE36879,C
50 POKE36875,8
60 PORT=1T0180 NEXTT
70 GOTO20

```

```

10 50=36878
20 57=36877
30 56=36876
40 55=36875
50 54=36874
60 POKE55,15
65 POKE55,123
70 POKE57,255
75 POKE58,8 PORT=1T050 NEXTT POKE59,15
80 POKE55,155
85 POKE58,8 PORT=1T050 NEXTT
90 RESTORE GOTO50

```

```

2 PRINT"*****"
3 PRINT"HELLO I AM A COMPUTER MANIAC"
4 PRINT"0-----"
5 PRINT"*****"
10 POKE36878,15
20 S=INT(RND(1)*50)+175
30 C=INT(RND(1)*50)+1
40 POKE36879,C
50 POKE36875,8
60 PORT=1T0180 NEXTT
70 GOTO20

```

# JOBS WITH complanet

Complanet Tele Services Ltd is a new company set up to handle all aspects of Complanet — a new communication based information and telecopying service for the Commodore 64.

We are currently looking for a number of people to help us run the service. If you have some of the following attributes we would like to hear from you.

- A good education
- Knowledge of the COM 64
- A helpful and responsive telephone manner
- Administrative skills
- A flair for keyboard graphics

This could be your chance to build a career in the home information and services industry of the future. Please telephone or send details to:

**John Clarke**  
**Complanet Tele Services Ltd**  
**Belford House, Gilestone Street**  
**London W1F 8DF 01-627 0948**

## PROGRAMMERS



We are looking for freelance machine-code programmers to join our team. We are a growing company and have already secured significant levels of national and international distribution for our games, educational and utility software. We have been asked by our developers to extend our range of talent. We are prepared to lend equipment to programmers of high calibre.

We are particularly interested in hearing from programmers who either have programs ready for us or who will be able to produce programs for MOS, Attn: ad, Commodore Spectrum and Atari.

We package our products extremely well and have facilities to produce extensive documentation should this be necessary.

The managing director will be pleased to give further information. Please telephone 01 426 1400 or 01 426 1401.

**Dream Software Ltd (Dept FOW)**  
**PO Box 64**  
**Beaconsfield, Bucks MK41 2LB**  
**Tel 02966 26107**



Hot outside?  
You could be even warmer.

# LEWDO!

It's new... It's naughty... It's a game for adults only.

FOR THE COMMODORE 64 — £6.95

Twilight Software 186 King Street London W8 5QU

0203 20001 (available for credit) — 0203 20002

### COMMODORE 64 DATABASE — DATAFILE

Presently opens twelve profit-effective accounts: eleven standard, one trial (app. demonstration) and one deferred (sales history/stock information). Includes daily field sales manual, graphs and bar charts, worksheets etc. Fully menu-driven, with comprehensive help to use. Price £100 (sample).  
Com 64 compatible. **orders £12.45**  
Com 64 compatible. **order £11.95**

### COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor. Features include — large text buffer, auto correct, wordwrap, tab, insert, delete, copy, paste, find, word count, right justify, align, join, file, multiple file handling, print elegant text etc. Fully menu-driven with comprehensive help to use instructions. Great value.  
Com 64 compatible. **orders £8.25**  
Com 64 compatible. **order £7.75**

All programs with full documentation and guaranteed and can be used with all direct connect CMM64 systems including 1520 printer/ploter. Also model computers, hard systems, software manuals. Price includes full delivery to first three post. Cheques/POs to: **0-8-5 5657546**  
**21 Ashton Road, Twicken, West Midlands B69 2AP**

### 1 GREAT GAMES

from

SHARPOUR

SOFT TALKING

COMES IN A

PRICE OF

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

### JOLLY JACK'S

FOR

ADULTS

ONLY

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

AND

£10.00

**LOVE BYTES!**  
for Commodore 64

0203 20001

**JOLLY JACK'S**  
FOR ADULTS ONLY

0203 20002

**1 GREAT GAMES**  
from SHARPOUR SOFT TALKING

0203 20003

From the company who supplied Dragon Data with carrying cases & dust covers comes a carrying case & d/cover for the Commodore 64 & Vic 20

**CARRYING CASE (CASE PROTECTION)**

Price of £10.00 (including postage & packing) from Dragon Data

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

Dragon Data, 100 King Street, London W8 5QU. Tel: 0203 20001

## Street Bomber

Five members of England, Kent, each able to swim.

© 2001 by John Wiley & Sons, Inc.

which your automobile is running out of fuel and you have to leave the buildings below you to survive in order to make a safe landing.

Use in no other format

**Table 1**

© 2000 Blackwell Science Ltd, *Journal of Internal Medicine* 247: 395–402

Figure 3-6. *de novo* characterisation[illegible]

1. *Journal of the American Medical Association*, 2000; 283: 2686-2692.

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

Variable  $A_i$  = phase position,  $P$  = signed magnitude,  $WGS_{\text{max}}$  = number bits

[illegible]

Send us your Commodore programs, including a cassette — and a printout on plain white paper if possible. Each listing must be accompanied by a typewritten introduction describing the program and explaining how it is constructed. We pay \$4.00 for each key-line listing published. We cannot guarantee to return every program submitted, so please keep a copy. If you want us to return your listing you must include a stamped, addressed envelope. If you have any problems with the program, please write to the appropriate author, Software File Commodore Magazine, 15 (1) 1986, Raymond Mount, London WC8R 5US.



1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

**SCUK SETTING NEW STANDARDS  
IN CUSTOMER SERVICE**

**0730 68521 ANY DAY INCLUDING SUNDAY**

1. **Introduction**  
 2. **Background**  
 3. **Methodology**  
 4. **Results**  
 5. **Conclusion**  
 6. **References**



**EPSON LOW PRICE SPECIALS FROM £190**

EPSON FX800 (DOT MATRIX)	\$249	\$199	CALL
EPSON RX800PT (DOT MATRIX)	\$249	\$239	CALL
EPSON FX800 (DOT MATRIX)	\$249	\$324	CALL
EPSON RX1100 (DOT MATRIX)	\$249	\$365	CALL
EPSON RX1100 (DOT MATRIX)	\$249	\$385	CALL
EPSON RX1100 (DOT MATRIX)	\$249	\$499	CALL



**NEW! Canon PW-1080A £269.00**



80 cpi; High speed printing, 180 CPS, bi-directional logic seeking, fantastic 27 CPS masterform quality, 29 x 18 mm, very quiet - less than 50 dB; 4, 5, 8, 9 10 12, 17 CPS; down loading for user optional characters; high resolution graphics; handles various forms, roll paper, fan fold, card sheet and multiple page cases.

ALSO AVAILABLE THE CANON PW115A as above but 156 code £160.00

100

**PHONE 0730 68521 SEVEN DAYS A WEEK**

**JUNI 6100 inst. £349**



2007: 2007-01-01 to 2007-01-31  
 2008: 2008-01-01 to 2008-01-31  
 2009: 2009-01-01 to 2009-01-31  
 2010: 2010-01-01 to 2010-01-31  
 2011: 2011-01-01 to 2011-01-31  
 2012: 2012-01-01 to 2012-01-31  
 2013: 2013-01-01 to 2013-01-31  
 2014: 2014-01-01 to 2014-01-31  
 2015: 2015-01-01 to 2015-01-31  
 2016: 2016-01-01 to 2016-01-31  
 2017: 2017-01-01 to 2017-01-31  
 2018: 2018-01-01 to 2018-01-31  
 2019: 2019-01-01 to 2019-01-31  
 2020: 2020-01-01 to 2020-01-31  
 2021: 2021-01-01 to 2021-01-31  
 2022: 2022-01-01 to 2022-01-31  
 2023: 2023-01-01 to 2023-01-31  
 2024: 2024-01-01 to 2024-01-31  
 2025: 2025-01-01 to 2025-01-31  
 2026: 2026-01-01 to 2026-01-31  
 2027: 2027-01-01 to 2027-01-31  
 2028: 2028-01-01 to 2028-01-31  
 2029: 2029-01-01 to 2029-01-31  
 2030: 2030-01-01 to 2030-01-31  
 2031: 2031-01-01 to 2031-01-31  
 2032: 2032-01-01 to 2032-01-31  
 2033: 2033-01-01 to 2033-01-31  
 2034: 2034-01-01 to 2034-01-31  
 2035: 2035-01-01 to 2035-01-31  
 2036: 2036-01-01 to 2036-01-31  
 2037: 2037-01-01 to 2037-01-31  
 2038: 2038-01-01 to 2038-01-31  
 2039: 2039-01-01 to 2039-01-31  
 2040: 2040-01-01 to 2040-01-31  
 2041: 2041-01-01 to 2041-01-31  
 2042: 2042-01-01 to 2042-01-31  
 2043: 2043-01-01 to 2043-01-31  
 2044: 2044-01-01 to 2044-01-31  
 2045: 2045-01-01 to 2045-01-31  
 2046: 2046-01-01 to 2046-01-31  
 2047: 2047-01-01 to 2047-01-31  
 2048: 2048-01-01 to 2048-01-31  
 2049: 2049-01-01 to 2049-01-31  
 2050: 2050-01-01 to 2050-01-31  
 2051: 2051-01-01 to 2051-01-31  
 2052: 2052-01-01 to 2052-01-31  
 2053: 2053-01-01 to 2053-01-31  
 2054: 2054-01-01 to 2054-01-31  
 2055: 2055-01-01 to 2055-01-31  
 2056: 2056-01-01 to 2056-01-31  
 2057: 2057-01-01 to 2057-01-31  
 2058: 2058-01-01 to 2058-01-31  
 2059: 2059-01-01 to 2059-01-31  
 2060: 2060-01-01 to 2060-01-31  
 2061: 2061-01-01 to 2061-01-31  
 2062: 2062-01-01 to 2062-01-31  
 2063: 2063-01-01 to 2063-01-31  
 2064: 2064-01-01 to 2064-01-31  
 2065: 2065-01-01 to 2065-01-31  
 2066: 2066-01-01 to 2066-01-31  
 2067: 2067-01-01 to 2067-01-31  
 2068: 2068-01-01 to 2068-01-31  
 2069: 2069-01-01 to 2069-01-31  
 2070: 2070-01-01 to 2070-01-31  
 2071: 2071-01-01 to 2071-01-31  
 2072: 2072-01-01 to 2072-01-31  
 2073: 2073-01-01 to 2073-01-31  
 2074: 2074-01-01 to 2074-01-31  
 2075: 2075-01-01 to 2075-01-31  
 2076: 2076-01-01 to 2076-01-31  
 2077: 2077-01-01 to 2077-01-31  
 2078: 2078-01-01 to 2078-01-31  
 2079: 2079-01-01 to 2079-01-31  
 2080: 2080-01-01 to 2080-01-31  
 2081: 2081-01-01 to 2081-01-31  
 2082: 2082-01-01 to 2082-01-31  
 2083: 2083-01-01 to 2083-01-31  
 2084: 2084-01-01 to 2084-01-31  
 2085: 2085-01-01 to 2085-01-31  
 2086: 2086-01-01 to 2086-01-31  
 2087: 2087-01-01 to 2087-01-31  
 2088: 2088-01-01 to 2088-01-31  
 2089: 2089-01-01 to 2089-01-31  
 2090: 2090-01-01 to 2090-01-31  
 2091: 2091-01-01 to 2091-01-31  
 2092: 2092-01-01 to 2092-01-31  
 2093: 2093-01-01 to 2093-01-31  
 2094: 2094-01-01 to 2094-01-31  
 2095: 2095-01-01 to 2095-01-31  
 2096: 2096-01-01 to 2096-01-31  
 2097: 2097-01-01 to 2097-01-31  
 2098: 2098-01-01 to 2098-01-31  
 2099: 2099-01-01 to 2099-01-31  
 2100: 2100-01-01 to 2100-01-31  
 2101: 2101-01-01 to 2101-01-31  
 2102: 2102-01-01 to 2102-01-31  
 2103: 2103-01-01 to 2103-01-31  
 2104: 2104-01-01 to 2104-01-31  
 2105: 2105-01-01 to 2105-01-31  
 2106: 2106-01-01 to 2106-01-31  
 2107: 2107-01-01 to 2107-01-31  
 2108: 2108-01-01 to 2108-01-31  
 2109: 2109-01-01 to 2109-01-31  
 2110: 2110-01-01 to 2110-01-31  
 2111: 2111-01-01 to 2111-01-31  
 2112: 2112-01-01 to 2112-01-31  
 2113: 2113-01-01 to 2113-01-31  
 2114: 2114-01-01 to 2114-01-31  
 2115: 2115-01-01 to 2115-01-31  
 2116: 2116-01-01 to 2116-01-31  
 2117: 2117-01-01 to 2117-01-31  
 2118: 2118-01-01 to 2118-01-31  
 2119: 2119-01-01 to 2119-01-31  
 2120: 2120-01-01 to 2120-01-31  
 2121: 2121-01-01 to 2121-01-31  
 2122: 2122-01-01 to 2122-01-31  
 2123: 2123-01-01 to 2123-01-31  
 2124: 2124-01-01 to 2124-01-31  
 2125: 2125-01-01 to 2125-01-31  
 2126: 2126-01-01 to 2126-01-31  
 2127: 2127-01-01 to 2127-01-31  
 2128: 2128-01-01 to 2128-01-31  
 2129: 2129-01-01 to 2129-01-31  
 2130: 2130-01-01 to 2130-01-31

OPTIONAL 2512  
TRACTOR AND  
SHEET PILE

SHINWA CP80 £179.00



Protein and feeder feed as standard 18Cups  
19-Dietrich legal smoking  
13 a 18 diet means giving true  
Gardens: sub and supergroups  
like, giving and auto exporting  
Continued emphasis  
expanded and double strike loan  
to reach in a lot. Fiscal  
markets: limit as standard

**WE WILL MATCH ANY GENUINE PRICE ADVERTISED  
SCHUKO IS NEVER BEATEN ON PRICE**

MANY MORE  
PRINTERS  
AVAILABLE  
1,000s OF  
BARGAINS  
SEND NOW FOR  
FAMOUS SON  
CATALOGUE



### FIDELITY 14" COLOUR MONITOR & COMPOSITE VIDEO



100

1000

We can supply interfaces for all types of computers including: AT&T, NEW BRAIN, IBM, ADVANCE, VIC 20, MICROTRON, SINCLAIR QL, SPECTRUM, AMSTRAD, COMMODORE 64, ORIC, OSMONK, SAGE, ACORN ELECTRON, MACINTOSH, DRAGON, TEXAS INSTRUMENTS, APRICOT, PET, TANDY, APPLE, SHARP, BBC, SANYO, ETC.

Orders can be placed for major credit cards. Backer's Center Postal Orders Building Directory Changes dispatched every day. 24 hour nationwide delivery by Express. Ch 50, 1-800-445-0000. All orders shipped by the Mail Order Promotion Bureau. Nationwide membership service is provided. Educational discounts are available.

**SC(UK)** 0730 68521 12 HIGH STREET,  
PETERSFIELD,  
HANTS GU22 2JG

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

### RESEARCH PROBLEMS INFLUENCING MARKETING RESEARCH DESIGN

PERSONAL CALLERS WELCOME FOR DEMONSTRATIONS  
ANY DAY AT OUR SHOWROOMS — JUST OFF THE A3

**URGENT ORDER**



# DISK SPECIAL

A collection of features on disk software and hardware including an easy-to-enter book contest — in the first sector.

## Slipping a disk too many

*Pete Gernard looks at floppy games, and on the whole is pretty much disk-gasted*

When a program has had a vast amount of pre-release hype projected around it, it seems as something of a relief when the program concerned actually lives up to expectations. Such was the case with Commodore's *Wanderland* Super cartridge.

However, when the program does not perform as the press releases, hand-outs and promotional publicity would have us believe, then the disappointment with the program is that much larger. *Alice in Wonderland* falls repeatedly into this latter category.

Written by the same programmer as *Androgam*'s earlier success *Missile Mania*, the disk and joystick minimal game does have quite a good opening move: *Alice* very poorly scolded around the screen. The game starts when an infuriated *Alice* jumps down a rabbit Warren and falls down and down and down. You have to move her around and collect baskets, keys, food and drink, whilst avoiding bumping into things and poisons. When *Alice* lands, you then have to use the keys collected earlier to drive through a variety of doors of different sizes (which is where the food/drink comes in, to make your character grow and shrink as well, to find rooms which look better to top the first).

### Letterboxed

Being hit by a flying clock signals the end of the first part of the game, and you are presented with a few lines of text from the *Alice in Wonderland* books while waiting for the next part of the program to load.

That time you're out on the garden, with a chicken-cat growing nastily as you while a pop smoking caterpillar blows cloudly smoke rings everywhere. *Alice* has to jump around and collect bread and butter and drinking horses (which turn immediately into croquet balls in part four of the game), avoiding the aforementioned smoke rings and weeds which (three particularly noxious flowers keep sprouting everywhere).

The third part of the program I found to be the most tedious of them all. The screen has now moved on to a chess board, featuring *Alice* and two white knights on one side, and Tweedledum and Tweedledee

(with a tiny help from the letterboxed) on the other. *Alice* has to get from one side of the board to the other, using the knights in temporarily reverse a far opponent. The speed of movement is said to be as fast as the light, and once you've got a knight on the Queen's Book 7 square it appears impossible to move it again: a logical perversion?

The final part of the game is a risk-taking game of croquet, complete with flamingo as mallets that no hedgehog in disguise could beat.

The levels of skill are offered to you at the start of the game, although these didn't appear to be much difference between any of them that I could detect. But a game I can imagine returning to very often: nice graphics, shame about the game.

Regular readers of this discussion magazine will recall a review a few months ago of a game called *Fortitude* (Rain, written by our Paul Norman, and released over here by Androgam). The review was pretty favourable, although the hype was repeated that there might be some better software on the way shortly.

Well, *Current of Karma* is the next offering from young Norman, and if the standard of the game is anything to go by, let's say my life as a programmer who is improving all the time. This is certainly an advanced game, but with one major difference from most of them: that only

does it rely heavily on the use of graphics, but also your only controls over the player is via a joystick rather than the keyboard.

You have a number of cameras to explore, and these are depicted on the screen in a glorious 3 dimensional display which scrolls in all directions as you move your face around the place. He has them and their ropes (which programs some full-screen graphical displays at times), scroll along as he watches, jump all over the place and also shoot any of the many moves that come at him. Falls off a great distance are to be avoided, as is bumping your head on a rock above you. Two lives are awarded in all, and you are rewarded if any lives lost by a number of landmarks at the top of the camera.

### Insider

This is not an easy game to play, and the beginner will do well to position moving about at the top of the camera before plunging in and taking on the game itself in one place, where the going gets rather tricky, there is an indicator to help you out. *Alice*, and there is a database of all games that only on the screen to perform a number of different tests. It is all so easy to try and move the indicator and even playing it out on the dose of a card.

That said, this is a very worthy follow up to *Fortitude* (Rain) and if enough games enthusiasts have got their disks it should do very well indeed.

Another from Androgam, *Frankie Freddie* is a pity named. I guarantee that people who have a copy of this game will be driven frantic by the unusual background that accompanies it.

If the game was played in real time, it would be a reasonably (but not a great) piece of software. However, each of the ten screens has a supposedly different piece of music being played whilst you're on that screen, and the quality of the music is quite superb. Some of the tracks being played are a little obscure (Holograms by Paul Simon surely won't be known by too many people), but their rendering is simply wonderful.

Even on the usual display (before you start playing the game, there's a special condition of Crazy Little Thing Called Love, the Queen number).

Send the game itself. *Freddie*, a ▶



*Alice in Wonderland* — graphics good, game pretty?

4 telephone answers, one day happens in minutes across a magical telephone network. Part of gold is mined off over the phone, and you have to get them all. However, those parts of gold are guarded by various obstacles, and the words is (as they say) tricky. Life is made a little more complicated by the fact that you can't go through obnoxious poles and have to climb up and around them, whereas the others can march directly through.

#### Interludes

Apart from the music, nothing much changes from level to level. It does get a bit harder, but not too much. An interesting twist is offered between some of the levels, which it's worth playing to get to see. On the first interlude, we see our hero being chased and finally caught by a massive frog, but on the second one Frodo has his revenge, and after being chased off one side of the screen by the frog he reappears driving a massive tank and blows the frog to smithereens.

No, like all those who like trying to score that elusive one, a point to keep an eye (and ear) out for.

The company who've gone into this boxed game is a big way is Microdeal down in Cornwall, and the rest of the disk games looked as if the match being to them. Microdeal, as we all should know, made their name by producing a lot of good Dragon software. Unfortunately, with only a couple of exceptions, they don't seem to have got the hang of the 64 yet.

**Guarder** is an unusual variation of the main theme, with two states instead of one. Right treasure are divided up between the mines, and it is your job to go around and collect all of them. However, the mines are guarded by what Microdeal refer to as Golems, and they have a habit of only of bumping into you and killing you, but also of making off with your treasure after you're safely robbed it away.

The trap around from mine to mine by pressing the fire button, which is a convenient way of getting out of the way of a particularly nasty golem. On some of the later levels the only possible way of completing the game is by continuously snipping around. This is because in one mine you're represented by a conventional looking character, who can't walk through



*Rustlethor Forest — a bit like Jurassic*

walls, while the character in the other state is simply a square that which has the magical ability to break walls made as though they were marshmallows. Thus by jumping from one character to another you can get your way out of some pretty sticky situations indeed.

#### Isidori

Some pretty crude graphics are used throughout the game. I suspect he has a life in something a bit more dramatic than just squashing a spider in both directions. Also the sound, as with a lot of Microdeal games at best, is tedious bombarding on the second, and although I don't particularly like playing games in which the same music is used whenever I happily knock all the rats and played on in blood peace and quiet.

An unfortunate start from a company whose experience promises better than this.

You see a full page advertisement for a game, and you immediately begin to think that perhaps that game is going to be a bit special. **Arms 1980** does not live up to his advertising, and indeed it was quite hard to remember what the game was about, we kept referring to my notes when I came to writing the review, and the sign of a good game.

It is one of those affairs where you start off in the middle of the screen, and have to shoot the enemy of those who march obediently towards you all the time. In contrast with most Microdeal disk games there are absolutely no instructions, supplied either with the disk or on the screen, so a couple of lives will be lost when

you try and figure out which part the screen ought to go in. Part 2 is the worst, if you happen to buy a copy. Another peculiarity about the game is that it started the cassette music going when it finished loading. Why is that? It's totally unnecessary, and not one only means that the program can't get totally at home with the 64.

Nothing is particularly changed from level to level. More ships appear in the same bordered tradition, but nothing else seems to happen. A game that is, and everyone else here at the middle Cornwall games centre, became very quickly tired with.

Most of you will probably be familiar with the game of Froggy or Froggy as it is sometimes called, but for the benefit of the Triumvirate (which means it is, here again with a summary of Froggy).

#### Isidori

The game takes place in the frozen wastes of the north, where you a powerful ice dragon, suddenly find yourself being attacked by hordes of Marooned soldiers. In order to get rid of the soldiers you have to push blocks of ice around, and hopefully you the dragons against the sides of the screen by doing so. Points are scored for every soldier killed, and in this Microdeal version of the game you also get points for every block of ice moved, regardless of whether or not it succeeds in getting rid of one of the enemy.

The original game I liked, and can remember spending many a tea party passing a man full to get my name on the highest score list. This, however, is not a worthy version of that original program.

Not a game that will, down well here, and once our games centre covers most age groups I don't really see this doing very well.

The remaining Microdeal games are definitely in a class above the previous ones, and **Danger Ranger** had me playing it for a long, long time.

You control a little man whose job it is to collect tin cans from the Chamber of Punks. The Chamber of Punks is in fact little more than a collection of yellow plants across the screen, with a handy transporter at the bottom to take you back up to the top should you stop on a five plants or so, with one here per plant, each one is guarded by something or other. Microdeal refers to them as floating cans,



*Grabber — don't get caught by the goblins*

radioactive bomb, and strong eyes.

Your little man has the ability to move left or right, jump or duck, and fire at any of the hazards that confront him. If you manage to collect all ten keys you are then taken back to the next level, which is very difficult to get through. You have to run along a series of blocks, watching out for drops of acid and the four demons that guard this level. Unfortunately, the drops of acid appear at random and once you start off at the top of the screen and they move very quickly downwards, you can guarantee on losing at least one life on this level.

#### Spaced out

If you manage to complete this it's back to the first stage again, but with more enemies to get you. An interesting and entertaining game making special in the way of graphics or sound, but a fun idea and one that has been neatly implemented.

The Cribfest chapter seems to get everywhere, and now we find him deep in Cribfest as Speed, a game that seems more than a passing resemblance to Impact from Human.

Cribfest has been sent on a mission of plunder in the heart of the Minoan civilization.



Cribfest in Space — plundering the planet.



Danger Ranger — collecting items and avoiding acid.

system. On landing on each planet, you have to collect Cribfest's ship by flying around in your programmed way in a number of fast stages consecutively used on the screen. To make life more interesting, you can only carry one key 'pod' at a time, and the longer you take to collect them all, the more enemies come flying across the screen at you. You can shoot them down, but by the time you're on the last couple of pods there's no many of

them that you're almost bound to lose at least one life.

#### Challenge

After surviving enough fuel, you have to where around and collect as much treasure as you can before you're forced to take off and land on another planet. To escape the tolls of having every level looking remarkably the same, occasionally you will get an enemy malfunction and have to send a golden shield to obtain spare from some spot where co-ordinates are given on the screen. Meanwhile, the evil Minoans have planned a bomb on your spaceship, so the shield is also involved in a race against time, to get back and take off before the bomb explodes.

This is quite a challenge. Still, it usually managed to survive.

After this it's back to the main game again, and more heads-down no compasses, endless stage blowing. Good fun, even if it isn't particularly original.

As an overall conclusion, the standard of disk based software can't get up to the highest quality arcade games, and even again we can only sit back and wait for the better software that is sure to come from consoles, controllers. ■

## You can win a Disk Companion

### on Sanyo's easy-to-use content

THIS IS YOUR chance to win a copy of Sanyo's best selling *Companion 84 Disk Companion*, by David Lawrence and Mark England. The book is the authoritative guide to making the most of the 324 disk drive, with simple instructions in the theory and practice of disk control. Backed up with programs for manipulating the disk directory, moving "scratched" files, merging, lists and displaying the structure of the disk operating system.

If you can't afford the

difference between sequential, relative and random access files, this is the book for you! Normally £7.95 in the shops, but our lucky winners will receive five copies from Sanyo. Simply answer the two questions and complete the coupon, fill in your name and address, to arrive no later than the last working day of October. Normal competition rules apply.

- 1) What is the name of the program that re-directs disk data?
- 2) What is the meaning of the abbreviation BAM?
- 3) What is the management found on the 324 disk drive?
- 4) How many bytes can be stored in one sector of a 324 disk?
- 5) How many tracks are there on a hard disk?
- 6) Is it dangerous to remove the disk if the RED light or the GREEN light is on?
- 7) What is the name of the program that "fixes" disk drive?
- 8) And what is the name of the IBM's standard replacement?
- 9) What is the IBM's normal drive number?

10) What is not a disk command: SCRATCH, VALIDATE, RENAME, NUMERATE, COPY

Telephone (complete in 20 words or less) — "I'm about to win a disk."

# Delving into disk drives

*A further adaptation from The Commodore 64 Disk Companion  
by David Lawrence and Mark England*

THE FIRST use that anyone makes of a disk is to store programs. There is no doubt that, if you enjoy computing and are going to more than occasionally, the difference in speed with which you can access programs makes the cost of a disk drive worthwhile compared to a cassette recorder.

At the same time, it is always surprising how little care most people take in the keeping of programs that they have spent long periods developing. Failing to save regular updates when a program is being developed, failing to check that a program has been properly saved, keeping only one copy of important programs and allowing disks by leaving them around exposed to the elements. Given below are one or two common-sense rules which it comes to saving programs.

As you develop new programs, **SAVE** them regularly. Like any other micro-computer, the 64 can lose programs if there is a momentary surge in the electricity supply, or if someone tucks the plug, or even because in just programming you manage to upset the 64's equivalent. How much work you will have lost will depend on how long it has been since you last saved your program. If a program is being entered rapidly, you should not normally expect to enter less than more than 17 minutes without saving the program. When a program is being debugged, so that relatively brief changes are being made, perhaps you might increase this period to half an hour. It really depends on how much you are prepared to lose, but you can depend on the fact that if you do not save programs regularly you will, sooner or later, lose an important program that has taken a long time to enter.

## Saving

In order to embark on a policy of **SAVING** programs regularly, you need first to know the command which will store a program on the disk drive. If you have previously been working with a Decadisc cassette recorder, then you will have become used to the format:

```
SAVE<"PROGRAM NAME">
```

```
to SAVE a program or
```

```
LOAD<"PROGRAM NAME">
```

when **LOADING** a program back into memory.

With your disk drive installed, the situation changes slightly. While the 64 can use it perfectly well with the 1541, it is designed to

the assumption that it will be used with a cassette recorder. This fact allows users of a tape recorder to get away without specifying any very important piece of information, namely the number of the device on which the program is to be stored. The device number of the cassette recorder is one, and when the instruction:

```
SAVE "PROGRAM"
```

is entered, the 64 assumes that what is meant is:

```
SAVE "PROGRAM":1
```

When working with disk, the programmer cannot rely on the 64 to put the important piece of information in, so the format of the **SAVE** command will normally be:

```
SAVE<"PROGRAM NAME">:n
```

```
and of LOAD:
```

```
LOAD<"PROGRAM NAME">:n
```

When a single disk drive is bought from the dealer, it is set up internally to think of itself as device eight, and it will respond to any instruction addressed to a device with that number, like the **SAVE** and **LOAD** commands in the last section. An increasing number of people, however, are discovering the advantages of having more than one disk drive. With more than one drive, however, a problem arises in that the device num-

bers which of them is being addressed at any one time.

## Devices

To overcome this, 1541 drives are built with the ability to change their device numbers so that a command can, for example be issued in the form:

```
SAVE "PROGRAM":9
```

to store one of the drives, leaving device eight completely unchanged. There are two ways in which disk drive device numbers can be changed: in hardware and in software, this is to say you can either make a modification to the equipment itself or you can use a program to make a temporary change. Of the two, if you are going to be permanently using more than one drive, the hardware solution is by far the best. It normally involves making a small cut in a single track of the printed circuit board inside the drive. Details of this are given in the 1541 manual but they are not very clear and, finally, we would recommend that when you purchase your second 1541 you do so on the understanding that the dealer will do the two channel 'work' involved. If your dealer hesitates in the idea then perhaps you might consider finding out who he was what he is doing.

## Rescue

To change the device number of a disk drive with a program is not difficult (see Chapter 10), but it can become tedious, and it might be done every time the drive is switched on. Even so, if you are merely borrowing a friend's drive for the day, the software solution is a better one than rubbing his drive to pieces.

To make saving a program easier and to manage up yourself to do it, it is a good idea to build a program saving facility into each program you develop, along the following lines:

```
1 GOTO 3
```

```
2 SAVE<"@PROGRAM NAME">
```



```
VERIFY PROGRAM NAME"*)
STOP
```

### 3. REMARK

Including such a routine in a program has the virtue that you are unlikely to wipe the program under the wrong name due to a typing error; it can be saved simply by entering GOTO 3 as an added bonus, it means that all new programs can be stored with a uniform GOTO 3 if you do not wish to use RUN and wipe out any stored variables.

Two features of this routine need some explanation, the command VERIFY and the modifier 'g0' at the beginning of the program name.

One of the main reasons for building the SAVE routine into the program is shown in that it can then be combined with VERIFY. The purpose of VERIFY is to check that a program stored on a specified device is the same in every respect as the program currently in memory, so that a program has been correctly SAVED. The format of verify

```
VERIFY "(PROGRAM NAME)"*,
<DEVICE>
```

where PROGRAM NAME is the name of a program stored on the device. Note that it is not important that the name of the program on the disk is the same as the name that you have allocated to the program in memory. The name of the program is stored on the disk's directory but not with the program itself, and so names it stored in the memory of the 64 for the current program. All you are doing is giving the disk driver the information so find a particular file.

### Verify

Unlike the routine intended, the disk drive requires no work from the user when VERIFY is employed; in the basic SAVE routine in the previous article, the drive will automatically search out the program which has been SAVED without the user intervention.

Fig 1

BYTE REMARKS	
1	Type of file as per
9	0 = Unused or Deleted file
1	1 = Unused SEQControl file
2	2 = Unused PPGram file
3	3 = Unused User file
4	4 = Unused RELative file
108	108 = Closed Deleted file
109	109 = Closed SEQControl file
110	110 = Closed PPGram file
111	111 = Closed User file
112	112 = Closed RELative file
8	Track of first block in file
2	Sector of first block in file
3-18	File name padded with zeros (space = CHR\$(0))
19	Relative files — track of first side sector of file
	Order file types — Not used
20	Relative files — Sector of first side sector of file
	Order file types — Not used
21	Relative files — Length of record
	Order file types — Not used
22-25	Not used
26-27	Only used when disk is SAVING or COPYING a file with 'g0'
28-29	Number of blocks in this file

Fig 2

```
10 DIM DIR(100) : DEF = 0
20 GOSUB 1000
30 FOR I = 0 TO DF-1
40 PRINT CHR$(10);DIR(I)
50 NEXT I
60 END
1000 REM *****
1010 REM READ IN DIRECTORY
1020 REM *****
1030 DF = 0
1040 OPEN LDRN,"R"
1050 GET #1,TL : GET #1,TS
1060 GET #1,LS : GET #1,LT
1070 IF TL="" THEN CLOSE #1
1080 RETURN
1090 GET #1,LS : GET #1,TS
1100 GET #1,LT
1110 IF TL="" THEN CLOSE #1
1120 THEN 1080
1130 IF TL="" THEN 1080
1140 GET #1,TS
1150 IF TL="" THEN 1130
1160 GET #1,TS : GET #1,LT
1170 DIR(DF) = TL : DF = DF+1
1180 GOTO 1100
```

In one respect the disk drive is a little less easy to use than the Datamaster recorder. When you wish to store a program for a second time on tape, all that you have to do is remove the tape and issue the SAVE command — the previous program will be overwritten. Not so with the disk drive, for it is specifically designed to prevent you from making the mistake of accidentally overwriting a file by accidentally SAVING another of the same name. This is done in such circumstances that when successive versions of a program are SAVED it can become a little tedious. The Disk Operating System (DOS) provides a facility to overcome this problem in the form of the modifier 'g0' attached to the front of the name of a file/polygon a program file or any of the other kinds described later — with the exception of relative files.

When the DOS comes across a filename which begins with 'g0' it automatically scans the current disk to see whether there is a program with the same name as the specified filename less the 'g0'. If there is not, then the program is stored normally. If there is a program of the same name, the program being SAVED replaces it on the disk — the previous version will not be recoverable once it is overwritten.

### Caution

A little of caution has to be exercised over the use of 'g0', due to the fact that the routine which runs the facility has a 'bug'. On disks which are becoming full, you will sometimes find that the use of 'g0' will successfully store the file named, but will attempt other files on the disk. The reason for this is that 'g0' seems under some circumstances, to fail to register the Block Allocation Map (BAM) the system picture of the sectors on the disk which it has used or which it has freed, so that subsequent files are SAVED in places they should not be.

There are several solutions to this problem. 1) Include a VALIDATE com-

mand in line 1 of the basic SAVE routine earlier in the article. This reconstructs the BAM and ensures that there will be no corruption, the only drawback being that it can take longer to VALIDATE than it does to remove a disk. 2) Save off by calling the program something like TEST1 and, each time you SAVE it, LIST line 1 and change the number on the end of the program name. This is perfectly simple but a does take up a lot of disk space while a program is being developed. 3) Ignore the bug — it will very seldom, if ever, affect you. If, of all, use FILENAME and SECTORS, two housekeeping commands, to obtain a much more styled and secure method of SAVING programs and other types of file.

### Variable

The process of keeping a variable program safe does not and need not you have stored in just a single disk. Data can be damaged or accidentally corrupted in some way. If a program is being keeping, then you should always have a second copy of it stored somewhere safely away from where you normally keep your data.

In addition, don't neglect the relative safety and reliability of tape for backing copies of important material. A serious disk drive fault can be extremely frustrating if your only copies of the required programs are on disk. If exposure is anything to go by, most people starting out with a disk drive will ignore this advice; at least until the first occasion on which they really lose a program on which they have been working for weeks.

In last month's article, we included a brief description of the disk directory. Since then

Fig 3

```
10 OPEN LDRN : OPEN LTR,"R"
20 DIM DIR(100)
30 GOSUB 1000
40 FOR I = 0 TO DF
50 IF TS=108 THEN IF TS=108 AND I<=100 THEN PRINT MID$(DIR(I),9)
60 NEXT I
70 CLOSE #1 : CLOSE #2
80 END
1000 REM *****
1010 REM READ DIR INTO DIR
1020 REM *****
1030 DF = -1 : NT = 0 : NS = 0
1040 TS = NT : S = NS
1050 PRINT "TS:";TS : PRINT "NS:";NS
1060 PRINT "TS:";TS : PRINT "NS:";NS
1070 GET #1,TS : NT = ASC(TS)-CHR$(0)
1080 GET #1,TS : NS = ASC(TS)-CHR$(0)
1090 IF TS=108 AND NS=108 THEN 1040
1100 DIR(I)=TS:"P" : I=I+1
1110 FOR J = 0 TO 7
1120 GET #1,TS : GET #1,TS
1130 DF = DF+1
1140 DIR(DF)=""
1150 FOR J = 0 TO 39
1160 DIR(DF) = DIR(DF)+LEFT$(TS+CHR$(0),1)
1170 NEXT J
1180 IF NT=0 THEN 1040
1200 RETURN
```



we have taken the function of the directory, in allowing the user to examine the contents of a disk and in allowing the Disk Operating System to find specified files on the disk, rather far afield. In this section we shall take a brief look at the directory, as far as and the way in which it may be directly accessed by the user.

In last month's article the overall layout of the tracks which make up the directory is given. Examining the table shows that the directory is held on track 11 of the disk, beginning at sector 0. The first sector of the directory is given over to the Block Allocation Map, but the remainder of track 11 is reserved for the details of individual files on the disk. Each of these sectors is capable of holding the details of eight files. Given that there are 12 sectors on track 11 of the disk, simple arithmetic shows that the maximum number of files which the disk can hold, regardless of how much space is free, is 96, or 144.

Within the overall structure of the directory, the format of the entry for a single file is given in Table 1.

The file types, stored in byte 0 of the entry, can be made use of in an MCRATCH program, where the user are allowed to examine files which were registered in the directory as having been deleted.

## Files

The first track and sector bytes, and the filename itself, can be used by a program to trace through the sectors allocated to each particular file and thus to display the name of the relevant file against each sector on the disk. In normal use, the purpose of these bytes is to allow the DOS to search through the directory for a specified filename and then to find the beginning of a file which a has been instructed to access.

Rotated files are in fact made up of two quite separate sections, one containing the data and the other recording where the sectors holding the data lie on the disk. The table shows that the start address of the second part of a rotated file is held in bytes 19 and 20, while the final length of each record in a rotated file is held in byte 21.

Bytes 26 and 27 are also in use, but this one is quite simple. When a file is SAVED or OPENED using the 'gtr' switches to specify that any previous file of the same name and type is to be overwritten, these bytes serve the purpose of building the starting track and sector until the new file has been created.

## Directory

Finally, when the directory is displayed for the user, the size of each file in terms of the sectors used is given with it, and this figure is stored in bytes 33 and 34 of the file entry.

In all, each individual file entry in the directory takes up 36 bytes (026). In order to spare the eight possible entries registered within the 256 bytes of the sector, two extra bytes are added to the end of the first seven sectors. These bytes contain no useful information, their purpose is solely to allow the DOS to scan along the directory in steps of 32 bytes.

There are two main ways in which the directory may be read: 1) By loading it into memory with the command LOAD "P", <DEV>, where DEV is the device number of the particular drive. When loaded in this way the directory is treated in much the same manner as a program file, and any program previously in memory is lost. Loading is possible because the 'P' indicator in the DOS that a file to transfer the directory as it is on the disk into program file format, creating each entry as if it were a

program file, supplying the new bytes to finish lines and space for link bytes. In other words, the format supplied to the 64 when the LOAD "P" command is entered is entirely different to the format of the directory on the disk itself.

2) By reading the directory from the disk under program control. The 'DOS support' software provided first with later 1000 provides a neat means to accomplish this and prove the contents of the directory table without interference to the current program. It is, however, quite possible to read the directory from BASIC. Given in Figure Two are two short programs which will load the contents of the directory into an array, the first by reading the directory file much as a program file would be read (see Chapter 11, and the second reading the disk more directly.

## Arrays

The DOS supplies the directory in the form of a program file, with every filename built into a separate line and the whole being properly structured with link bytes and so forth. There is one point in trying to compare what is being read by the G&T statements with the contents of the table at the beginning of the chapter, now there is almost no relation between the two. What is being read here is not the directory itself but the translated version of the directory supplied by the DOS.

Figure Three gives a program for reading out an array from disk.

**Lines 10-30** This section controls the execution of the program. Its three main functions are to open the error channel and call for the allocation of a disk memory buffer, to call upon the read module, and then to point out selected files from the array.

**Lines 1000-1200** The overall function is to read the contents of the directory into the array D10.

**Lines 1300-1600** The contents of a single sector are read into the buffer and the buffer pointer set to the beginning of the buffer. The first sector to be read will be track 11, sector 0.

**Lines 1700-1900** The first two bytes of the sector, which are pointers, are obtained and stored in the two variables NT and SL, standing for Next Track and Next Sector. On the first pass through the module, the sector pointed up will be the RAM, so the program immediately moves on to the next sector.

Fig 4

```

1000 GOTO 1000
1000 REM# *****
1010 REM READ 154 DIRECTORY
1020 REM *****
1030 CP = 0
1040 OPEN DEV0,"P"
1050 GET#4:G1 GET#4,TS
1060 GET#4:G2 GET#4,LS
1070 IF TS="" THEN CLOSE:G
1080 RETURN
1090 GET#4:G3 GET#4,LS
1090 GET#4:G4 GET#4,TS
1090 IF TS="DIRCHNG" AND TS=""
1090 THEN GOTO

```

**Years 1996-1999** The boiler passage is set back to the beginning of the block, then the right life criteria contained in the report are successfully read. This involves discarding the two current testing tries and then obtaining the next 50 observations. The Richardson entry is then placed as a line at the end of the array 544.

**Tip: 1994-1999** If the next track pointer indicates track 0 at this stage it is a sign that the spring which has just been dealt with is the last in the assembly.

There is a possibility of the success of the LORAN "B" method and the 1950's support facilities to run the detectors, there are the systems on which it is worth running the detector facility. One can, however, make be otherwise an operation is to be performed on multiple. The very few commands could be used with the system matching facilities that the LORAN system. With a little bit of programming, however, it is relatively easy to construct systems in cars and an overview on a whole series of them which make a certain part, and the degree of the ability to read and make use of the information contained in the detectors.

Figure 4 gives a program which will repeat an operation for a number of times.

**Lines 1100-1110.** The module to read the keywords from the directory using the flag of the two methods illustrated in the second version of the code.

**Lines 11000-11200** These last compare two wrongs, one of which is the name of a life taken from the dictionary, the second from a sister poem in the next section.

which is the pattern against which all the disk files are to be matched. The pattern may be set up using the '\*' and '?' notations. The only important product of the module is the value of the variable %NAME of the program being considered by the module matches the pattern, then the value of %NAME will be left in column one, otherwise it will be zero when execution of the module ends.

**Lines 10000-10009:** This module is the main control module, which first calls up the module at line 10000 to read the directory name the array D18, then sends messages to the names in the previous module for comparison with the patterns typed by the user. As each finding is processed in the form of the answer of T18, which records the type of the file. For use is made of line in the current program has one might like to employ it to include, reverse the type from an agreement, regardless of their name.

1000

In actual use, Barry would need to be aware of module specifying exactly the action was to be performed on a file which matched the pattern. This new module would be new to us as our new information and would be called by the CDS/ISL at the 0110. Now, since there is no valid file number in 0110, the system cannot be run successfully as it is present here - you can't find and the new action specifying the action to be performed. Given below is an example procedure illustrating the use of the REPEAT facility.

to Enter and LEAVE the REPEAT program shown above.

To Take a disk which contains no important files (something may go wrong) or format a new disk and SAVE on a new file with different name — the content of the file is irrelevant but the filenames should be less than 16 characters long.

To LCDAD the report facility and amend it by entering the following new or changed lines:

```

1400 GOSUB 14000
14000 REM *****
14010 REM RENAMES ALL FILES
14020 REM *****
14030 OPEN IS,DEV,IS
14040 COMS = "RENAMES 2" + MS +
      " - 0" + N1
14050 PRINT "IS,COMS"
14060 CLOSE IS
14070 RETURN

```

Fig. 2.4.10 The uncontrolled process can render the system unstable as it is

2) **ELIM** the program end, when asked to enter the pattern simply gives **RETURN** which enters a single asterisk indicating that no filename will be acceptable as a match.

4) When the program terminates, load the directory and you should find that every one of the files on the disk has a "2" at the beginning of the filename. If so, you have successfully carried out a procedure which would be impossible by means of normal system commands. ■

The *Commuters in Suit Company*, by David Lawrence and Mark England, is published by Random House, at \$1.95.

**Attention all Commodore 64 owners with a 1541 disk drive**

## MPS TOOLKIT

- **Single Drive 3 Pass Disk Backup**—for individual files.
  - **File Copier**—transfer any number of files up to 232 files in a single pass.
  - **Single Pass Scanner**—also checks for paper breaks, EOL's & all.
  - **Disk Drive Monitor**—makes 20, 21, 22 & 23 passes necessary for proper backup of protected disks.
  - **Disk Doctor**—diagnoses all user reads and changes sectors, recover lost data.
  - **CDRS Changer**—Protect your own disks.
  - **Loading Address Recorder**
  - **VLS Recovery**
  - **How many more useful features!**
- Written and/or edited entirely by members only. **MPS TOULCOX** can backup 90% of all disks. Hard Copies available with confidence. **MPS TOULCOX** is easy to use. **MPS TOULCOX** is a must for all C 64 owners with all 5.25, 5.25, drives.

ONLY F.D. 99, including P.D.  
 Parents and/or (Name and C.D. DOB)  
 Send photos or P.D. no  
 long non-traditional  
 TWO-STEP-STEP DOWN-STEP

Having obtained the upper hand in this desperate desert battle, the enemy is about to launch its final offensive on your battle red zone.







## For work or play Voltmace has the answer!



Made in  
England

**For play:** The delta 3sc joystick is intended for the most sophisticated users. A lightweight unit designed to be held and operated by the fingertips of the other hand. The rotary slide switches control the 8 directional movements. They are tested for millions of operations (choice of three) have been tested for millions of operations.

**For work:** The datapad 16c—a sixteen way full travel keypad for the CRM 84. Simply plugs into the top of the datapad. Complete with a cassette program to define the key choices. In operation just put on the "shift lock" to select key 000.

**DATAPAD 16c** £29.95  
**DELTA 3sc JOYSTICK** £9.95  
Prices include VAT and P&P

Send cheque or PO to—  
**Voltmace Limited**  
Park Drive  
Baldock  
Herts  
SG7 6BW  
Telephone (0462) 894810

## Voltmace datapad 16c & delta 3sc

Callen welcome at the factory—Monday to Friday. Dealer terms available.



### ARE YOU OFFERING A COMMODORE PRODUCT OR SERVICE?

Offer it where it'll be seen — £40 buys this space for one month and puts your business in front of thousands of proven Commodore enthusiasts and trade contact nationwide.

Call the **COMMODORE HORIZONS Ad Dept**  
on 01-407 4545  
You could be here next month.

### ASTROLOGY for beginners

A Starter Pack comprising a simple step-by-step calculator & programme, an introductory booklet and two self-teaching programmes that will teach you the techniques only £11.50

**No previous knowledge required**

Available for Commodore 64 & Commodore PET  
0800-000000000

Also many other programmes for more experienced astrologers

Please send me the following Starter Pack for me to:

London or elsewhere ( ) £11.50 (see ad) ( ) £11.50 (see ad) ( ) £11.50 (see ad) ( ) £11.50 (see ad)

Name \_\_\_\_\_

Address \_\_\_\_\_

ASTROLOGY Dept CH 67 Passmore Road  
Hemel Hempstead Herts HP1 8JH tel 0462 51806

# THE SPREADSHEET IN A CLASS OF ITS OWN



Q Which spreadsheet is suitable for accountants, engineers, scientists and home users?

A: Autocalc 64 is ideal for any application involving extensive manipulation of data and formulae from financial planning to market research.

Q Which spreadsheet offers an advanced level of formula handling?

A: Autocalc 64 copes easily with trigonometrical functions, parentheses and boolean logic as well as totalling and averaging.

Q Which spreadsheet accepts complex conditional statements?

A: Autocalc 64 can handle statements as complex as IF  $a1 < 4,000$  OR  $a1 > 8,000$  AND  $a2 = 500$  THEN  $a1 = 0$ .

Q Which spreadsheet offers a flexible screen format?

A: Autocalc 64 allows you to select (i) column widths from 3 to 30 characters (ii) the number of rows/columns you need (iii) up to 2,000 cells of information (iv) text or numerical entries lined up to the right or the left, or a combination.

Q Which spreadsheet offers a choice of numerical formats?

A: Autocalc 64 gives you a choice of (i) integers (ii) floating decimal points (iii) currency (iv) any combination of these.

Q Which spreadsheet offers a full replicate facility?

A: Autocalc 64 has an advanced replication function for transferring text, data, formulae or conditional statements from any cell (or block of cells) to any other(s) without monotonous retyping. A go-to facility will take the cursor instantly to any cell of your choice — saving time.

**24 HOUR  
CREDIT CARD HOTLINE  
06286 63531**

**CBM64 ONLY  
TAPE £14.95**

**CBM64 ONLY  
DISK £19.95**

Q Which spreadsheet is easy to use yet advanced in operation?

A: Autocalc 64 is designed to guide you — helpful error reports diagnose input or formulae errors. A full demonstration program and comprehensive instructions are included.

Q Which spreadsheet is compatible with standard Commodore printers?

A: Autocalc 64 gives you a printout facility using any of these printers: Commodore 1515, 1525, MPS 801, 1526, MCS 801, DPS 1101, Seikosha GP100VC.

Q Which spreadsheet is 100% machine code for fast efficient responses, and offers a choice of saving to disk (using 1541 drive) or to tape using a C2H unit?

A: Autocalc 64 — as if you didn't know!

Q Which spreadsheet sells at a realistic budget price?

A: Autocalc 64 costs just £14.95 on tape, £19.95 on disk inclusive of VAT and P&P.

Q Where do I get one?

A: Ring us now on 06286 63531 (24 hours) to place your ACCESS or VISA card order, or complete the order form and send it to us today. (Prompt delivery promised). Autocalc 64 is available only direct from Richard Shepherd Software.

Please send me:

\_\_\_\_\_ Autocalc 64 Disk at £19.95

\_\_\_\_\_ Autocalc 64 Tape at £14.95

(Cheques orders add £1.50 P&P)

I enclose Cash/Cheque/P.O. payable to Richard Shepherd Software Ltd. OR please debit my ACCESS/VISA card No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Signature \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

A company of computers is a tool and that they are really only of use in so far as they are used to do the work of men. — Sir Isaac Newton

**RICHARD SHEPHERD SOFTWARE**

ELM HOUSE, 23-25 ELMSHOTT LANE, CIPPENHAM, SLOUGH, BERKS. TEL. (06286) 63531

## Cracking the code

**Book:** *Mastering Another Code on your Commodore 64*  
**Author:** Mark Greenwald  
**Publisher:** Janyfax  
**Cost:** £1.95

**Reviewer:** C. H. Hinchey  
 I am usually very wary of any book that claims to be able to teach you something quickly and easily, especially where the subject is as tricky as M/C. However, in this instance, the author's claim is not too exaggerated.

The book is well laid out in sections that follow an order well known to each other. The style is easy on the brain and each new topic is adequately explained with example programs.

The book begins with a 'review' of all the Assembly commands and programming notes of the 6502 chip. Also included here is a listing of BASIC/Basic — a 6502 Assembler/Macro — for you to copy in. Unfortunately, I could not get the program to work for me. Although it was being saved on the tape, it refused to come out of hiding when asked to LOAD. There is also a short program error that tries to start you off at the wrong memory location. If you don't have an example of your own to run to, you don't have a problem.

Section 2 shows you how to use your new found knowledge to gain advantage. Topics covered include BASIC's screen scrolls, Sprite manipulation, interrupts, music, timers and bit set graphics. There is also a sub-section showing how to address Basic commands. All these subjects are well explained and are shown to work by using excellent examples that could easily be used to good effect within a larger program.

Section 3 continues all the ROM routines and explains how to use them. The Appendix has the usual contents — memory maps, kernel interrupt table, ASCII charts, etc.

Considering the subject matter, the book is very readable as well as being instructive and I think the author is to be congratulated for his efforts. For anyone wishing to learn M/C on the

64 I would recommend this book. But with some reservations... (this SUPERFANUS rating)

## Manual labour

**Book:** *Getting the Most From Your V60*  
**Author:** Paul J. Leach  
**Publisher:** Prentice-Hall - Mary Tim (USA)  
**Cost:** £5.95

**Reviewer:** David Shepherdson  
 Here is a book that picks up where other guides and manuals leave off. So much the publisher's blurb. Personally, I would say that the manual it picks up from is the one supplied with the machine by Commodore. However, if you do not wish to delve quite so deep into the V60 as the Reference Guide takes you, then this book will make an excellent addition to third edition to your computing library.

Section one takes you step by step through many small programs. The programs range from simple print runs and how to display them efficiently, to quickly executing menu drives and even how to incorporate a joystick into your program. The chapter on graphics is

character, you should have no problems entering them. One thing I do feel however, is that some of the programs could be lifted up a little and more use could have been made of multi-segmented lines. Otherwise, an excellent book for the beginner, and even a useful book for the more advanced user.

## Worthy but dull

**Book:** *First Substitution for Commodore Computers*  
**Author:** Eddie Adams  
**Publisher:** John Wiley  
**Cost:** £15.95

**Reviewer:** Thomas Darnell  
 Eddie Adams makes no claim to harness the V60-P60-C64's graphics or sound potential. His *First Substitution* contains a 'no frills' library of modules designed to facilitate moving and conversion operations of the 'square kilometers to square miles' and 'bytes to Newborn' type. They will run on most members of the Commodore-P60 family and, with minor amendments on many other Basic models.

If you are the kind of chap who regularly needs to convert, say, British degrees into Kelvin degrees, you will probably be able to do so on

A useful reference tool to have on your shelf, should you ever need a program to calculate your instantaneous altitude or vector velocities or memory data transfers per square metre (sorry, meter), but not which, I fear, offers Basic graphics benefits and sets less than value in the average market.

## Well in advance

**Book:** *The Advanced Commodore 64 Handbook*  
**Author:** Peter Lupton and Roger Robinson  
**Publisher:** Century  
**Cost:** £5.95

**Reviewer:** Phil Bower  
 Let us suppose you are an enthusiastic user of the 64, who is proficient in Basic and would like to go further. You have obtained Commodore's *Programmer's Reference Guide* but find parts of it too technical. You would particularly like to experiment with sound and screen graphics, or Basic and Assembly, to wonder what the best interpreter used to add a few extra commands to Basic. The trouble is that you have been able to find a suitable book to meet you.

Look no further! This superb volume is the very thing you need. Included as a companion to the *Commodore 64 Handbook* by the same authors, it stands on its own as a well-written, informative and useful volume for any 64 owner's bookshelf. As well as covering the points mentioned earlier, it provides a comprehensive guide to the use of disks and printers as a means for expansion to Commodore's own offerings. Add to the numerous listings of program examples and screens, and you have a publication which is hard to resist.

This is indeed a book to dip into at random and explore at depth. It is packed with information presented clearly and logically, with several helpful appendices. It would almost be worth £10 for the 48 pin version alone. My only criticism is of the index which is justifiably not included, but compared with the rest of the book this is a minor detail. Highly recommended!



excellent, one of the choices I have told Antony who is unsure on just how to obtain and use this Defined Capable should find that this section will answer about 99% of their queries.

In section two, there are 30 application programs ranging from calculating your cheques to a mail order. All the programs should fit into the expanded V60 and, as character codes are used as the language instead of control

your pocket calculator at half the time. Part — one touch this — Adams has devoted a tiny but useful section to systematically correct your spelling of tricky words like Fibonacci or Rosetta.

The range of subjects covered in these 300 odd pages is impressive, topics include angles, area, business profits, capacity, energy, compound interest, logarithms, pressure, volume measurements and many others.





## ANSWER BACK

### Cricketer stumped

I HAVE THE complete records of my cricket club going back 25 years. Using my 64 I should have no difficulty in storing details of every match, but I should like to be able to sort out individual performances and summarise career statistics for the players — several hundred over the years. Can you advise me on a program which would carry out the statistical sorting, collating and averaging, or do I have to set about working out my own program?

D J Don  
Bristol

THERE ARE several commercial databases which could help you out, such as Superbase and dBase. However, you will have some limitations if you're using a 1541 disk drive because of the amount of information you need to store.

You may need a CERN 8330 double disk drive which can fit drives from a 64 using two 5 1/4" disks instead.

It may be possible to use a 1541, but it would require a lot of planning and you would have to use many disks, with the resulting sorting which would mean if you put one record per match, and with several years' details of players, scores, and so on, then you multiply by the number of matches per year and by 80 years, you'll find that an enormous amount of disk memory is required. If you have to use several disks, you're limited in the searching you can do in them.

### Two pass assembler

I USE THE Decca Picocon cross assembler from Honeyford on my Vic 20. Recently I have read about a two program with a "two pass" assembler. Could you explain the difference between

"two pass" and a normal assembler?

R J Pharohead  
Hampden Works  
Widenedale

TWO ASSEMBLERS use the "two pass" system by which forward addresses are calculated on the second pass. Using a label for a forward address which is not defined until later in the program causes the linker with its single pass assembler, which would report an error instead. Our pass assemblers can only deal with already referenced labels, but the two pass assembler has the reference from the first pass.

### Don't overwrite

I HAVE A 64 and am having trouble coding using the assembler printed in May's Commodore Magazine. However, I don't want to destroy any of the programs when I store the machine code. So how do I protect the Basic program from overwriting?

T G Blair  
Aberdeen

TRY USING the positions 10000 to 10077, which gives you 4096 bytes for code. Alternatively you could lower the top of Basic to protect your machine code programs from being overwritten by Basic variables. To lower the top of Basic to 10766 (decimal) POKE 16,128, and then you can also use 14800 to 15177 for your programs.

### Brother Vic

I HAVE a Brother HF22 electronic typewriter, which I wish to link to my 64 and use as a printer. However, none of my local Commodore or Brother dealers has any idea as to what cables are needed to link the two. The HF22 has RS232C and serial ports and manuals have mentioned that it is compatible with the 64.

David S Cooper  
Birmingham

YOU WILL need a Vic 6814 cartridge, available from

Commodore dealers. The cartridge plugs into the rear port of the 64 and converts the RS and serial outputs into the pins or cables necessary for RS232C standard.

The cable should be constructed as follows: use an RS232C cable with 25 pin D-type connector. At the printer and connect up pins 2 (transmit) 3 (receive) 7 (ground) and 20 (data terminal ready). Your printer may manual should show which pins relate to the above.

At the computer end connect pin 5 (data to serial) to the wire from pin 18 (printer), otherwise go above.

The wires in pins 2 & 3 may need to be crossed over depending on which way the printer operates is implemented.

### Superbase sorted

I AM HAVING a problem with the Superbase program. Having loaded the program from disk and entered one of my own data files, I can print or display screen 80 columns over 60. The output then defaults to 40 columns and the primary or secondary command of any sort will cause the output to return to 80 columns. It needs a QUIT and reload to do the trick.

My second problem is in looking to get any programs from cartridge-loaded programs. CalcRom and Diary 64 from Pacific are both 40 column files, but despite trying all combinations of device numbers I consistently get the message "DEVICE NOT PRESENT". Both programs behave perfectly otherwise. At the 64 floppy is one of several incompatibilities, how come I can achieve 80 columns printed over 80 columns from

Emascript? Finally, what are the price and cost of disk and cartridge?

Robert Lee  
Card

EMASCRIPT 64 Superbase for the 64 program is £ 1.99. I have a problem with Commodore Interchange Contact (Preston) Software,

44-408 5th, and they will arrange an exchange for an updated version. It may be that the Interchange programs also have some difficulty with your Commodore interface — contact Hander on 0444-778808 to check.

Cartridge loading is by far the quickest and most reliable form of software loading. The main disadvantage is that careless connection and disconnection of cartridges may lead to damage of the cartridge slot. You could consider inserting in a suitable multi-slot motherboard to eliminate this problem.

### 1520 and Eoscript

I HAVE JUST bought Easy Script to use with my 64, 1541 disk drive and 1520 printer/plotter. Problems arise when I try to print on the 1520, with odd messages appearing on the screen but the 1520 itself is working adequately. Margaret Payne  
Penny  
Scotland

HAVING checked Emascript on my 64 and 1520, I can advise you that it should work as follows. Press "F" and "P" for output, then "4" to set the device number. Enter 4 in response then RETURN, and exit from output mode and you have entered the test you want printed.

You'll need to use secondary addressing to use the 1520 with Emascript. Examples, from one to be provided by the rapid character set, 64 gives pop color BLACK, 64 gives BLUE, 64 gives GREEN, and 64 gives RED. Using 64 gives 80 characters per line, 64 gives 80, 64 gives 16, and 64 gives 16. Finally, 64 turns the printer

If you need help with a technical query or a problem write to Jack Cohen, Commodore Hardware, 12-13 Little Newport Street, London WC2N 6LS

# 3D COMPUTERS

## THE HOME COMPUTER SPECIALISTS

© 2000 Blackwell Science Ltd

with more branches  
than any other  
Canadian financial  
institution

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038



Small art pieces located  
throughout the grounds  
add to the overall experience.



Here is a complete display of the  $\mathcal{A}$ -module  $\mathcal{A} \otimes_{\mathcal{A}} \mathcal{A} \otimes_{\mathcal{A}} \mathcal{A}$  as a  $\mathcal{A}$ -module.

**WITNESS:**

All the best sellers from the top U.K. and U.S.A. software houses, eg  
 LLAMASOFT  
 DATASOFT  
 EPYC  
 INFOCOM  
 RABBIT  
 INTERCEPTION  
 SUPERSOFT  
 ON-LINE  
 ARSAD

## PERIPHERALS

DISCS  
PRINTERS  
JOYSTICKS  
MONITORS 35W/  
COLOUR  
LIGHTBULBS  
CAN CASSETTE DECKS

LARGE FRAMES ON WALLS  
 DISPLAYED CARPENTERS &  
 JOINERS PAPER ALONG BY  
 WINDOW

## ADVERTISEMENT INDEX

Acetylon	13
A & C Software	26
Amgen Productions	24
Amalgam	24
BSI	Discs for back cover
Beyond	54
Calco	Inside front cover
Compustone	26
Commodore	4 & 5
Chromastatus	26
Comview	26
Comsoft	9 & 11
Cybervision	26
Desktop 3D	42
Diadem	42
Meridian	42
Henson	14
JPL Software	22
Johart	42
M&T	42
MPS	26
New Generation	22 (23)
P&B	Inside back cover
Parford Shapard	22
Six Four Shapard Co	10
Six Four Plus	22
S&I Ltd	26
Stasoft	12
Six Four Software Centre	\$10 (23)
Telex FM	26
Trellars	2
Wright	26 & 27
Wulson	42
Wulson	22
Wulson	22

**Came for a song ...**  
**VIRGIN GAMES at £2.99**

The **LEARNING GOALS** said us that it was not going to tell **CONSUMERS** what we wanted or did anything about it so we could do what we wanted. We will be selling our shares for **\$67.00** instead of the original price of **\$5.00**. The **GOVERNMENT** paid us **\$1.00** instead of the usual price of **\$1.00** and **\$7.00**. That's a **SAVING** of between nearly **\$8.00** and **\$9.00** per share.

1. **Introduction**  
 2. **Background**  
 3. **Methodology**  
 4. **Results**  
 5. **Conclusion**  
 6. **References**

CRM #4	PERCENTAGE PROFIT	SALES
Falcon Patrol	\$6.95	\$3.94
Hidexon Bill	\$7.95	\$4.94
Ambush	\$7.95	\$4.94
VIC 30		
Mission Mercury	\$7.95	\$4.94
Smash	\$5.95	\$2.94
Croppers	\$5.95	\$2.94

**Question 10:** A 30-year-old male presents with a 2-week history of weight loss, decreased appetite, and fatigue. He reports a recent diagnosis of hypothyroidism and is currently on levothyroxine. Physical examination reveals a goiter. Laboratory studies show a free T4 level of 0.8 pmol/L (normal range 1.2–1.8 pmol/L) and a TSH level of 15 mIU/L (normal range 0.4–4.0 mIU/L). Which of the following is the most likely cause of his symptoms?

**Answer:** Hypothyroidism. The patient's symptoms (weight loss, decreased appetite, fatigue) and physical findings (goiter) are consistent with hypothyroidism. The laboratory studies confirm this, showing a low free T4 level and a high TSH level.

[illegible]

# A FREE LIGHTPEN

Now a FREE Light Pen! with every **GRAPHICS** Graphics is the ultimate 'drawing' 'designing' or 'painting' using the light pen of course which incidentally has a full 3 year warranty!! Graphics will arrange other things allow you to:

- Draw free handed on the screen anything from a Moby Dick to your latest integrated circuit.
- With alpha 16 colour interactive facilities of course.
- Operated via laser mouse plus software the day/step drive.
- Or directly over the drawing on the screen to the printer. And keep it for ever or send to a friend as a post card!
- Design your own colourful slides and characters.
- Play the games in the package or use the light pen in your own games/education/programming.

**GRAPHICS** is available on disk and tape. Tape version is £15.95 and disk version recommended at £19.95.



All you 1842/1841 disk users **GRAPHICS** is here at last. Graphics is the disk monitor you have been waiting for it will allow you to:

- read/write blocks from/to the disk
- display and edit blocks on the screen
- display and send disk messages/characters
- transfer your programs from tape to disk or disk to disk or even disk to tape! ■ and more!

**GRAPHICS** comes on Disk at only £9.95

Do you see tapes? Are you sick and tired of waiting for your programs to be loaded/saved from/to the tape? Then you need a **TORNADO**. Tornado allows you to save/load/write your Basic/ machine code programs faster than a CIMA 1841 disk drive itself. Due to popular demand Tornado now comes with new and more powerful commands plus more instructions to assist you in making fast versions of your existing machine code Basic programs. Tornado is available on tape for CIMA 84 and 86 - Vtg 20.

Do your Amibasic and Basicos keys often fail? Do you want to come out of those crashes? Or get into those undesirable programs? Then what are you waiting for, get yourself a **BOASER**. Boaser enables and lets your computer know who is the boss! Boaser can be connected to your machine in seconds, no soldering. Included with the Boaser is a copy of basic recovery software on tape. Now available for any CIMA 84 or Vtg 20.

**MAD SUMMER OFFER**  
A FREE BREAKER WITH  
EVERY TORNADO IF YOU  
USE THE COUPON BELOW

**BSF CSL, 82 FURNACE DRIVE, CRAWLEY, W SUSSEX  
RH10 6JE.**

Please send me ——— Tornado at £9.95 + p.p.  
Post Free

Please send me ——— Breaker at £7.95

Please send me ——— Am-File at £7.95

Please send me ——— Graphics at £19.95 (tape)

Please send me ——— Graphics at £19.95 (disk)

Please send me ——— GRAPH at £9.95

I enclose cheque/P.O. order for the sum of £

Name \_\_\_\_\_ Computer \_\_\_\_\_

Address \_\_\_\_\_

Please use this form and check orders only. All prices are ex-works or price listed order only and £3.40 p.p. (UK). Please post to:  
**BSF CSL, 82 FURNACE DRIVE, CRAWLEY, WEST  
SUSSEX RH10 6JE**



# GHOULS

Commodore 64  
(486KBIT LOADING TIME)  
electron  
B.B.C. MICRO

Run through the creepy mansion to rescue the power jewels. Dodge ghostly ghouls and bounding spiders, leap over poison-meared spikes, scamper along moving platforms, and use powerful springs to propel you onto overhanging ledges. Superb animation and spine-tingling sound effects.

£6.95

128K RAM and  
2MB hard  
disk (128K)

MICRO  
POWER

TAKE MY  
ADVICE! BOOST YOUR  
COLLECTION WITH JIMMY  
PELIX IN THE FACTORY  
AND CYBERTRON  
MISSION!

THE MICRO POWER  
GAME IS A  
CHALLENGING AND  
EXCITING GAME  
FOR THE  
COMMODORE 64  
AND AMIGA  
SYSTEMS.  
IT IS A  
FAST-PACED  
ACTION GAME  
WITH  
A  
VIBRANT  
GRAPHICS  
AND  
A  
SOUND  
TRACK  
THAT  
WILL  
KEEP  
YOU  
ON  
THE  
EDGE  
OF  
YOUR  
SEAT.



# Meet Percy & Monty

Win two games for the 64 from Granfile Graphics in Tony Roberts' contest

LIFE IS never boring in the Hell Neck Micro Club — the monks they're all playing *Dungeons & Dragons*, and things have become so heated that Warren, Tronzo and Zee have all built cardboard models of the Dungeon in an attempt to settle the debate.

One of them has got it wrong, however, and will come in a sticky end. Look at the three diagrams and decide which is the odd one out — each maze is viewed from a different angle, remember.

If you think you've solved the puzzle, complete the questionnaire on apt, training and original manner in fifteen words or less, and send your entry with your name and address to: Competition Corner, Commodore Magazine, 18/19 London Square, Street, London EC2M 3LP.

Two lucky winners will each receive copies of the Granfile Graphics games for the 64, *Percy the Potty Pigeon* and *Monty Mole*, which cost £7.95 in the shops.

*Percy the Potty Pigeon* is a fast-moving arcade game written by Tony Crowder, in which you must help Percy build his nest and avoid speeding cars and other hazards. *Monty Mole* features the Arthur Scargill and the Flying Pickets, out to stop poor Monty from collecting coal from the dangerous mines. It's another Tony Crowder production.

So the challenge is 'To be in to win a Granfile through me 64 because...'

Normal competition rules apply.

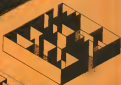
The winners of August's Microsoft competition are Simon Jeffrey of St Asaph, Caroline Butterworth of Boston Rags and Steve Crowell of Welling. Each winner will receive a Commodore 64 cartridge and modem which will enable the 64 to be linked to the Microsoft network service.



1. Warren



2. Tronzo



3. Zee

Go for it with Hyper Biker.....real barm warlike

NEW  
RELEASE  
AVAILABLE  
SOON

Now you can experience all the thrills, spills and skills of BMX racing without leaving your cosy armchair keyboard. Play on your own or with up to 3 friends to test each other and the quality you tune up by the computer. There are 6 different events but you must qualify on each to move on to the next. Trick features include table tops, whoops, de drops, ramps, speed bumps, drakes and drop offs.

You have complete control of your pedals, handlebars and brakes so that you can jump, wheelie and really perform. But go easy or you'll end up where you don't.

# HYPER BIKER

Available on Cassette £7.95

TRICK SHOT



SPEED JUMP



WHEELIE



CRUISE



## EVENTS

1. Straight Race 2. Wheelie Race 3. Wheelie  
4. Long Jump 5. High Jump 6. Heavy Bag



# **KoalaPad** Touch Tablet

## JUST PICTURE IT!



**JUST PICTURE IT - NOW ABLE TO DRAW YOUR OWN HIGH RESOLUTION GRAPHIC DESIGNS ON YOUR COMPUTER SCREEN WITHOUT HAVING TO WRITE A PROGRAM...**



**Well, now you can - with the amazing Koala Pad from Audiogenic!**

The Koala Pad Touch Tablet connects via parallel port to your computer through a special Commodore 64 and Apple II expansion interface board with a selection of built-in pens and a choice of 16 colours and 18 drawing & editing commands available.

But that's just the beginning. Includes every Koala Pad package includes the incredible Koala Pointer software which creates a whole's play to:

- Fill outlines with a colour!
- Draw straight lines!
- Make frames!
- Draw circles!
- Fill regions from a point!
- Move objects around!
- Copy shapes!
- Create colour images!
- Slide in or out!
- Swap shapes between two pictures!
- Save your pictures to disk or tape!

These programs are controlled entirely with the tablet by moving a cursor which is controlled with your mouse or pen. An optional AppleLink's Guide is also available to tell you how to incorporate Koala Pad pictures into your own programs.

Now you don't have to be an experienced programmer to produce real high resolution graphics with your computer. The Koala Pad from Audiogenic makes it as easy as a pencil and paper. **JUST PICTURE IT!**

**Available with Cassette or Disk software for the Commodore 64  
From all good computer shops - or direct from Audiogenic - just fill in the coupon!**

Please send me (QTY) Koala Pad Disk/Cassette! I enclose cheque/P.O. for:  
Commodore 64 Disk or Cassette £79.95†

THE KOALA PAD IS A PRODUCT OF

 **Koala**  
Technologies Corporation

Price is subject  
to change  
without notice

Please check to my Personal Bank/Post Office account to:

The via computer or bank/Post Office

Signature \_\_\_\_\_

Full Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Exclusive distribution in U.K. and Eire by

**Audiogenic** LTD

P.O. BOX 88, READING, BERKS